UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

REGION 5

LESSON PLANS

FOR

TRAINING FOREST GUARDS

FIRE CONTROL

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FOREWORD.

We feel sure all Forest Officers in Region 5 realize the importance of training as a part of their regular activities and that the training of our short term force is a matter of prime importance since it is upon their shoulders that we must place the responsibility of quickly discovering and successfully handling our fires in their early stages.

Their competence with tools and the judgment exercised by them during the critical stages of a fire are a measure, in the eyes of the public, of our success as an organization in suppressing fires. To the general public the fire guard is the Forest Service.

To assist Forest Officers in the furtherance of their training work a series of lesson plans have been developed. These lesson plans were developed with the primary thought of training the short term protection force but are equally applicable to any field of personnel training where similar subjects are to be taught.

The great demands on the time of Forest Officers and particularly Rangers was the motivating thought behind the development of these sample lesson plans. Forest Officers should not consider that with the lesson plans contained herein they need not develop others for their training work or that these lesson plans are final in every way. Some are merely suggestive and should be used as a guide to the ingenuity of the training officer to develop better and more complete ones for local application.

Even in those lesson plans that are fairly complete, study and possibly some changes for local adaptations are necessary. In other words, the trainer cannot expect to do a successful job unless he has thoroughly studied and better still rehearsed these plans. The only object in furnishing sample plans is to assist the officer who is already carrying a heavy administrative load. Ordinarily the trainer should prepare his own lesson plans.

S. B. SHOW, Regional Forester,

By J. D. Woodbury

Acting.

LESSON PLANS

for

Training Forest Guards

Forest Service Region 5

LESSON PLANS
for
TRAINING FOREST GUARDS

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INTRODUCTION

The Training Problem

The two principle functions of the Forest Service short term protection force and a direct responsibility of every Ranger is the prevention and suppression of fires. The success or failure secured in effectively preventing fires from occurring and suppressing them quickly and efficiently once they start is a measure of the degree of training realized.

In the California Region, all work on a Ranger District unit is a direct responsibility of the District Ranger. In its simplest form, the Ranger alone does the manual, clerical, and technical work and the planning involved. When the job grows and more men are employed, as is the case during the active fire season, the Ranger's work changes - he does less manual and clerical work and more planning, and a large portion of his time goes to a new kind of work - Supervision. One-fourth to one-half of supervision is training.

Training is another technical job, not new and not too difficult. A specialist may help the Ranger with his training, take part in his training duties, but still the Ranger must do training in connection with his supervisory work. It follows then, that the Ranger needs to be proficient in developing plans to accomplish this important activity.

Immediately he goes about developing such plans he is confronted with numerous specific problems requiring solution. Regrettable as it may seem, financial limitations make it necessary to furlough the entire short-term protective force as soon as the fire season is over. Only in a few instances is a member of the force carried on the rolls for more than five months during any one season. Due mainly to this hiatus in employment, the training invested in approximately 40% of those men is lost, since this percentage of the protection force find employment during the winter and do not report back for duty at the opening of the next fire season. This causes an infiltration of from 200 to 300 new men into the protection force of the California Region annually, which brings up the difficult problem of incorporating in the training program a curriculum for each new individual so designed that its application will correct the deficiencies brought out in the appraisal of the individual. Correlating the training program of the new men with the program training for the advanced and more experienced men with one, two, three, four, or more seasons' experience is an important problem to be solved.

In the California Region, dependence is placed upon per diem guards and other outside individuals in time of need. The individuals come from practically every walk of life, the rancher, the cattleman, the lumberman, the miner, the grocer, and others.

Special training plans must be made so these men may become competent in the duties we ordinarily expect them to perform.

Formulation of other plans to give fire training to the project laborers on a Forest, such as road and trail workers, CCC men, and others of like status, require attention and serious effort.

In making plans for this training, the Ranger should remember that similar to other lines of endeavor, a man becomes proficient in those things he does most. It follows from this that the jobs in which a protection employee has no opportunity to become proficient due to lack of actual practice should be emphasized, if important, and given high priority in the training program, regardless of the years of service of the individual. The training problem, then, is the job of taking 200 or 300 new men annually and 400 to 500 men of one or more seasons' experience, and in a comparatively short time weld these individuals into an effective and efficient fire control machine. The success of the above is, to be sure, dependent on well-thought out written plans to carry out the training policy developed for their particular units.

A false feeling of security should not lead the Ranger to believe that the training of an individual is successfully accomplished when he has demonstrated his ability to dramatize a prevention talk or to use the various mechanical tools at hand to suppress a fire. The mere knowledge of how to dramatize a prevention talk will not prevent fires unless the trainee has been taught the art of changing it to fit the needs of the individual or group of individuals to whom it is presented. It also should be emphasized that mere demonstrated ability to use fire tools is not an indication that the individual or individuals can successfully cope with a fire, even though its rate of spread and size upon attack indicates that he or they should. It follows, then, that training in fire suppression is not only a job of developing proficiency in the manipulation of tools, but also a job of developing the correct thought processes involving judgment and habit formation that will enable the trainee to employ the best strategy and technique in suppressing a fire.

To the end that the arts of prevention and suppression may be taught and skill in manual jobs developed, detailed lesson plans are needed that the trainee may receive the maximum amount of high quality instruction with the least amount of effort and cost.

The Purpose and Scope of Handbook

The purpose of the handbook is to combine in one volume for ready reference detailed lesson plans covering the more important lessons a Ranger must teach in his every day supervisory work and in the guard schools held each spring, also to help the Ranger in his inspection work, a detailed analysis of the positions of Fireman, Lookout, Tank Truck Operator, Ranger District

Dispatcher, and Protection Assistant are included. Use of these analyses will assist greatly in determining what a guard knows about his job, also the subjects in which he needs further training.

All lesson plans herein should not be considered complete in every detail. Some are only suggestive and should be used as a guide to the ingenuity of the Ranger in developing detailed lesson plans for local application. Also, it is not to be assumed that the lesson plans contained herein cover the entire field of fire guard training. These plans merely cover the topics that are common to the greatest number of fire guards. Each Forest Officer should develop lesson plans for other topics as the need arises.

No suggestions or instructions concerning the preparation of a training program or camp organization and service are contained herein. Such instructions are given in the text of the Service Fire Guard Training Handbook.

Methods of Instruction

Two instructional methods are used to present the numerous lesson plans contained in this handbook. Since most of the Ranger's training work has to do with manipulative skills, lesson plans using the Four Step Method of instruction predominate.

No attempt is made to train trainers in the art of instruction. The Service Fire Guard Training Handbook was written for this purpose and its contents should be thoroughly understood by every Forest Officer connected with training work.

For purpose of ready reference, the Conference and Four Step Methods of instruction are defined and briefly described.

Four Step Method

As indicated by the name given to this method of instruction, the Four Step Method is divided into four distinct parts:

Step I - Where the instructor by various devices arouses the attention, curiosity, interest, and desire of the trainee concerning the particular lesson to be taught.

Step II- Where the instructor demonstrates to the trainees how to do the job. He uses such devices as questions, explaining, reciting experiences, etc., in addition to the one main teaching device, "demonstration", to put over the lesson.

Step III- Where the trainee does the job. This step may well be called the "coaching" step because the instructor gives additional training where necessary.

Step IV - (a) Where trainee unassisted does the job. (Suitable for simple manual jobs.)

(b) Where the trainee does the job without assistance and explains principles involved, reasons for several operations, or procedure to other members of the group. (Suitable for more complicated jobs.)

(c) Where the trainee is required to pass a written test. (Suitable for lessons in map reading, field markings, reports, forms, etc.)

(d) Where the trainee is required to pass an oral test.

Lessons involving manual skills are best taught by the Four Step Method while lessons involving judgment development, dramatization, etc. can best be taught by other methods of instruction.

Conference Method

It has been said that any time experienced men group together to discuss a familiar subject with the thought of finding a solution to a given problem, that they are holding a conference. This is true and is as good a definition of the conference method as needed.

As indicated above, the men must have knowledge of the subject to be discussed and that they must group together to discuss the subject. One point that should not be overlooked and that is each conference should have a chairman or leader. This is necessary because some one must be in charge to see that the conference progresses smoothly.

There are two kinds of conferences; namely, "free" and "guided." A free conference is one where the answer to the problem, if there is an answer, is unknown to the chairman or leader, also to the others in the group. The guided conference is one where the answer to the problem is known to the chairman or leader but is unknown to the group. In the latter case, the conference leader or chairman guides group thinking and discussion along channels which will bring about the correct solution to the problem.

A conference is said to have four distinct phases:

Phase I - The group assembles facts, data, etc. that may have some bearing on the problem.

Phase II - The group sifts these data and keeps only what is pertinent to the problem.

Phase III - The group evaluates these data.

Phase IV - The group arrives at definite conclusions or decisions.

The Conference Method of instruction can be used to raise the level of knowledge of a group of men who have had experience as crew boss, fire boss, dispatcher, etc. It is unsuited to teach the manual jobs such as sharpening an axe, inspecting a shovel, line construction, etc.

ANALYSIS OF THE FIRE GUARDS' JOB.

ANALYSIS OF LOOKOUT POSITION

INDIVIDUAL

TRAINING INVENTORY CHECK LIST

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required	Trainee's Present Knowledge and Skill
A. DETECTION			
1. Learn Country			
a. Study country.		How to read maps.	
b. Use of maps.		How to read maps.	
c. By inquiry.		Whom to ask. What to ask.	
d. Explore country.		How to read maps. What routes to take. What notes to take. What to study.	
2. Detection of Smoke.			
(a) Systematic examination of terrain.		How to systematically survey the terrain. Period of examination of terrain. Intensity required.	
(b) Distinguish between true and false smoke.		Be able to identify fog, dust, smoke. Know location of industrial smokes. How to use binoculars.	
(c) Detect smoke quickly.		How to keep constantly alert. How to distinguish smoke quickly. Standards of detection.	
(d) Recognize hazard and risk areas.		What constitutes hazards and risks. Definition of hazards and risks.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
3. Operate Fire Finder.			
a. Level fire finder.		How to use spirit level. Where to lay on fire finder to determine level. How to level instrument by use of thumb screws.	
b. Orient fire finder.		How to determine north on map. How to orient map with respect to azimuth graduations on fire finder. How to orient fire finder with respect to topography. How to adjust plates for orientation.	
c. Use of azimuth.		What it is. How to read it.	
d. Adjustment of alidade.		How to plumb sights. How to adjust cross hairs. How to adjust tape.	
e. Use of alidade.		How to turn alidade. How to sight. How to adjust scale on tape.	
f. Use of vertical angle scale.		How to adjust sight. How to read vertical angle scale.	
g. Use of vernier.		Purpose of and how to read vernier.	
4. Locate Fire Accurately.			
a. Sight on smoke.		How to sight.	
b. Read azimuth angle.		How to read azimuth angle.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
c. Read vertical angle.		How to read vertical angle.	
d. Legal description of fire location.		How to read maps. Understanding of map features. Knowledge of country.	
e. Locate fire by land marks.		Thorough knowledge of country.	
f. Use of panoramic pictures.		How to use pictures.	
5. Reporting Fire.			
a. Make fire report Form 1-R-6.		Understanding of report form. How and what to record.	
b. Transmit report on fire to dispatcher.		Where, how, when and to whom to report fire.	
c. Estimate rate of spread.		How to estimate size.	
d. Current observations.		Standards pertaining to observations. What to look for.	
e. Report wind direction velocity.		How to estimate velocity and determine direction of wind.	
6. Watch for and Report Progress of Lightning Storms.			
a. Estimate distance to storm.		How to determine distance to storm by relation to land marks of known distances.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
b. Determine whether dangerous or cloud to cloud.		What is meant by cloud to cloud, and cloud to ground; ground to cloud. Dangers of each type.	
c. Record strikes.		Understanding of common terms used on forms. What form to use.	
d. Report approach and progress to dispatcher.		When, to whom and what to report.	
7. Make and Record Weather.			
a. Measure precipitation.		How to reach measuring stick.	
b. Take wind velocity readings.		How to dial and to convert from chart. How to read anemometer. How to read Beaufort scale.	
c. Measure humidity.		How to operate psychrometer. How to read psychrometer. How to use humidity tables. Purpose of wet and dry bulbs of psychrometer.	
d. Measure temperature.		How to read maximum and minimum thermometers. What are maximum and minimum thermometers.	
e. Determine wind direction.		How to determine.	
f. Determine degree of visibility.		How to determine degree of visibility.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
B. PREVENTION OF FIRE.			
1. Public Relations.			
a. Greet visitors.		How and why to greet visitors. How to maintain appearance.	
b. Register visitors.		How and why to register.	
c. Explanation of job.		Reason why he is on lookout. What he does. How he does it.	
d. Purpose of forest fire protection.		Policies of Service. Why fire protection is essential.	
e. Issuing and recording camp fire permits.		Know why permits are issued. How to issue and record.	
f. Distribution of literature.		Who to give literature to. What literature to distribute.	
g. Courteous and polite.		How to be courteous and polite.	
2. Care of Quarters.			
a. Good housekeeping.		Know how to sweep, clean, dust, scrub, polish, wash, arrange equipment in quarters. Know Service standards.	
b. Maintain buildings, grounds, equipment.		Know when and what to do, and how to do. Standards of maintenance. How to service, repair Coleman lanterns, safety precautions.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
c. Lightning protection.		Know how to inspect lightning protection and what it is for.	
d. Fire-proofing grounds and buildings.		Know how to recognize and eliminate hazards.	
e. Display flag.		When and how to display.	
f. Inspection check list.		What it is, how to use it, when and how to make inspections. Must know standards.	
g. Disposal of garbage.		How and where to dispose of garbage in a sanitary manner. When. Standards.	
h. Procurement and storage of food and water.		When, where and amount of food and water to obtain. Know how to properly store.	
i. Procurement and storage of fuel.		When, where, and amount of fuel to obtain. Know how to store.	
j. Closing of quarters for winter.		Know how and what to do.	
C. COMMUNICATION.			
1. Operation and Maintenance of Telephone.			
a. Use of telephone.		How to obtain use of line. How to talk. How to use receiver and transmitter. How to ring.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
b. Locate and repair instrument trouble.		How to test for and recognize trouble. How to make simple repairs. Knowledge of parts of telephone.	
c. Locate and repair line troubles.		How to locate line trouble. How to use telephone tools such as pliers, climbers, etc. How to make an emergency splice. How to make telephone hookup.	
d. Locate and repair ground trouble.		What the ground is and how to determine if functioning properly. Where ground is located. How and what to repair.	
e. Inspect and repair lightning protection.		How it works. When and how to clean protector blocks. What value is it during lightning storms.	
2. Operation and Maintenance of Radio.			
a. Use of radio.		Purpose of radio. Regulations regarding use. How to transmit. How to receive. What records to keep and how. Know call letters of radio.	
b. Replace tubes.		What tubes are used. How to determine if they need replacing and which ones. How to replace.	

ANALYSIS OF LOOKOUT POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
c. Install batteries.		How and when to install batteries.	
d. Put up aerial.		How to put up aerial. How high above ground. Direction of aerial. Insulation of aerial ends. Why it is important to keep it away from green trees, etc. How to repair. Length.	
e. Inspection connections.		What connections to inspect. How to determine if they are tight. How to tighten if loose.	
D. DIARY - LOG BOOK.			
1. Keeping Diary.		What points to be considered in keeping diary. What to write. How much detail. When to write diary. How to write.	
2. Keeping Log Book.		What to record. When to record. How to record. How to write.	

ANALYSIS OF FIREMAN'S POSITION

INDIVIDUAL

TRAINING INVENTORY CHECK LIST

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
A. SUPPRESSION.			
1. Receiving Report of Fire.			
a. Recording information.		How to write. What information to record.	
b. Questions to ask concerning fire.		What stock questions to ask.	
2. Get-away Time.		Regional elapsed time standards.	
3. Getting to Fire.			
a. Traveling.		How to drive car. How to ride a horse. Quickest route of travel. How to read a map. Knowledge of country. Regional elapsed time. Standards.	
b. Locating fire.		How to read a map. How to run a compass. Appearance of smoke. Smell of smoke.	
4. Size-up of Fire.			
a. Vegetative cover.		Relative resistance of control of various types of cover.	
b. Rate of spread.		Effect of differing topography, character of cover, time of day, wind, relative humidity, on rate of spread. How to measure rate of spread.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
c. Man power.		How to measure rate of spread. Chains of line one man can build and hold per hour. How to figure number of men needed.	
d. Point of attack.		How to determine the point of attack.	
e. Tools needed.		What tools are best suited for the particular fire.	
f. Use of tools.		How to use axe, McLeod, shovel, Pulaski, hazel hoe, rake, sledge, felling and bucking saw, back-pack pump, etc.	
g. Handle men.		Organizational technique. How to lead.	
5. Control of Fire.			
a. Line location.		Factors to consider in locating line.	
b. Use of water.		Amount to use, where to apply, dependency of water in controlling a fire.	
c. Line construction.		Type or types of line construction necessary to stop and hold fire. Use of natural barriers.	
d. Burning out.		How its done, when to do, and where to burn out.	
e. Mop-up.		What constitutes mop-up, when to do, where to do.	
f. Patrol.		What it is, where to patrol, how long to patrol.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
g. Corral, control time periods.		What these terms mean. Regional elapsed time elements.	
6. Fire Report.		How to prepare, when to prepare, who to send to.	
B. PREPAREDNESS.			
1. Care of Tools and Equipment.			
a. Recondition.		How to recondition. Able to tell when a tool is in good condition - inspection.	
b. Inspection.		What is inspection - how to inspect. What points to consider in inspection of D.B.axe, shovel, McLeod, Pulaski, backpack, flash light, Coleman lantern, etc.	
c. Check losses of tools.		Forms to use, when to do, how to record. What to check.	
d. Make periodic inspections.		Safety when making inspections, standards of inspection, when to inspect, forms to use and how to use them.	
2. Food Supply on Hand.		Regional policy.	
3. Care of Quarters.		Standards of cleanliness. How to sweep, how to mop, how to clean windows. When to do, etc.	
4. Care of Grounds.		Standards. When to do.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked.	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
5. Care of Person.		Standards of cleanliness. Clothes to wear. When to shave. What physical exercises are necessary to keep fit, how to accomplish. What foods to eat (simple dietetics).	
6. Be Prepared Mentally.			
a. Study fire plans and instruction.		How and what to study.	
b. Learn country.		Boundaries of unit. How to use maps, how to use landmarks, how to use information supplied by locals. Know where locals live.	
7. Make Service Reports.			
a. Writing diary.		What to write, where to write diary, when to write diary, and what points to consider when writing diary.	
b. Making out time report.		How, when, and where to make out time report. Who to send it to.	
8. First Aid.			
a. Taking proper care of his own ailments and injuries.		Simple first aid practices. Location of nearest doctor.	
b. Rendering first aid to others.		Simple first aid practices. Location of nearest doctor.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
9. Communication.			
a. Trouble shooting on telephone.		How to locate trouble. What to do to correct. When to request that the repairs be done by an expert.	
b. Set up portable telephone.		How to set up portable phone.	
c. Use of radio.		How to set up radio. How to operate.	
d. Trouble shooting radio.		How to locate trouble, what to do to correct. When to ask that repairs be accomplished by an expert.	
e. Making emergency telephone line repairs.		How to make emergency splice #9 wire; emergency wire.	
C. PUBLIC RELATIONS.			
1. Create Favorable Impression of U.S. F.S.			
a. Keep up personal appearance.		Standards of appearance and dress.	
b. Meet public properly.		Value of polite and courteous manner. Value of plain and effective language. How to speak well. Value of tact. What tact is.	
2. Dispense Information.			
a. Give out printed material.		Contents of printed material, what and when to give out printed material. How to give out printed material.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked:	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
b. Give oral information.		Value of plain language. How to speak effectively. Value of polite and courteous manner. How to be polite and courteous. How to read a map. Knowledge of country. Routes of travel. Recreational possibilities. Policies of U.S.F.S. Rangers' Catechism.	
3. Cooperating With Other Public Agencies.			
a. Report fish and game violations.		Fish and game laws. Who to report to. How to report and when to report.	
b. Enforce sanitation regulation.		Sanitation regulations. His authority. How to enforce and when to enforce.	
D. FIRE PREVENTION.			
1. Educate Public of Need for Fire Protection.			
a. Posting signs.		Sign posting standards. What signs to post. How to post signs.	
b. Registration.		Whom to register. How to use registration forms. How to speak effectively. How to be tactful. What tact is. How to be polite.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
c. Camp fire permit:		How to fill out camp fire permit. What fire prevention measures should be stressed. Requirements contained on camp fire permit.	
d. Talks in camp grounds.		How to speak effectively. What to say. Fire prevention objectives.	
e. Talking to individuals.		Effective language. What to say. Fire prevention objectives. How to secure interest of individual.	
f. Giving out printed material.		When to issue. What printed material contains. Who to give printed material.	
g. Display pictures.		When to display. How to display and to whom to display.	
h. Point out examples of prevention.		What to point out as examples. What to discuss when pointing out. Fire statistics.	
i. Inspection.		What to inspect. When to inspect. What to look for.	
2. Law Enforcement.			
a. Enforcing fire laws.		Knowledge of Federal, State and County fire laws. How to issue citations. What is the limits of his authority. Know what and where fire closure restrictions are in effect.	

ANALYSIS OF FIREMAN'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
b. Looking for clues.		What constitutes clues. How to preserve clues. When and where to look for clues.	
c. Appear in court.		When to appear. What to do after appearing. How to be a witness. How to effectively and clearly present evidence.	
3. Hazard Reduction.			
a. Construct fire break around camp ground.		How and where to build fire break.	
b. Reduce hazards in camp grounds.		What are hazards in camp ground. How to dispose of. Precautions necessary for safe burning. When to burn. Who authorizes.	
c. Supervise permittee burning.		Precautions necessary in safe burning. His authority to supervise. What to do if permittee violates burning permit.	
d. Inspection of residences and resorts.		What residences and resorts to inspect. What to inspect for. Authority. How to record results of inspection. Who to mail report to. What constitutes follow-up inspection.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION

INDIVIDUAL

TRAINING INVENTORY CHECK LIST

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
A. FIRE PREVENTION			
1. Sign Posting.			
a. Preparation.		Knowledge of posting plan. Location and kind of signs needed. Tools and material necessary. Who to do.	
b. Supervision of posting.		Knowledge of closures and restrictions in effect. Standards of posting, where, what, and in what form. Knowledge of posting plan.	
c. Supervision of sign maintenance.		Knowledge of sign maintenance. Who to maintain. Knowledge of maintenance plan.	
d. Supervision of sign removal.		Knowledge of closure and restriction policy. Knowledge of sign removal section of sign plan. Whom to remove.	
2. Issue Camp Fire Permits.			
a. Meeting the public.		How to meet the public. How to speak effectively. What to tell them. How to instruct them. Knowledge of Service policies.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
b. Recording applicant.		How, why, forms to use.	
c. Issue permit.		How to fill out permit. What permit form to use.	
d. Inspecting equipment of applicant.		How to inspect axe, shovel, for permit requirement.	
3. Law Enforcement.			
a. Advise subordinates.		Knowledge of laws and regulations; Federal, State and County. Knowledge of judicial townships.	
b. Issue citations.		Limitation of authority. How to make out a citation. How to present a citation to the defendant.	
c. Prepare reports.		What forms to use. How to record information. What information to record.	
d. Appearing in court.		How to answer questions intelligently. Knowledge of what constitutes evidence.	
4. Making Public Contacts.			
a. Meeting public.		How to meet public. What to say. How to say it. Knowledge of F.S.policies.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
b. Giving out information.		Where to secure information. What information to distribute. Whom to give information. Knowledge of Forest. Knowledge of current status of improvements and Forest resources.	
c. Public service.		How to render. Limitations imposed.	
B. PREPAREDNESS.			
1. Secure and Supply weather data.			
a. Making observations.		How to use psychrometer. What is a psychrometer. How to read psychrometer. How to convert readings into terms of relative humidity. What is relative humidity. How to use psychrometer tables. How to read hydrothermograph. How to service hydrothermograph. How to read anemometer. How to service anemometer. How to read rain gage. How to convert wind velocities into Beaufort scale units.	
b. Receiving data for daily reports.		Where to get data. What data to call for.	
c. Compiling and recording data.		Methods used. Forms used. How to make out forms.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
d. Transmitting data.		Where, when, to whom. Knowledge of weather code. How to use code.	
e. Interpreting data.		Knowledge of Weather Bureau nomenclature.	
f. Securing forecasts.		Where to obtain. How to secure.	
g. Application of forecasts.		Knowledge of nomenclature used. What it means. Knowledge of action required.	
2. Maintenance of Communication.			
a. Operate and maintain telephone communication system.		Knowledge of communication plan. How and when to make periodic checks. How to diagnose telephone trouble, line trouble. How to transmit knowledge of instructions pertaining to communication trouble. How to reestablish communication.	
b. Operate radio.		How to transmit. How to receive. How to make contacts.	
c. Service radio.		How to detect trouble. How to replace radio tubes. How to replace batteries. How to accomplish simple repairs.	

ANALYSIS OF PROTECTION ASSISTANT'S POSITION (Cont'd)

Jobs and Operations.	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
d. Install aerial.		How high above ground. What direction. How long an aerial to use. How to select the best location to install an aerial.	
3. Inspection and Training.			
a. Telephone training.		Must know teaching methods to use. How to work up problems for this type of training. What the fire guards should be taught. How to use telephone. When to use telephone.	
b. Training at guard school.		Know methods of instructions, i.e., Four Step problem, Conference, etc.	
c. Inspection guard force.		What inspection is. How to inspect Fire Guard. Importance of training in inspection.	
4. Plans and Charts.			
a. Maintenance of regular protection organization.		Know fire plan. Know planned location of Fire Guard force. Know when to service. How to service and what service is required for Fire Guard force. Know annual, sick leave, and compensatory time policies.	

ANALYSIS OF PROTECTION ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
b. Organizing for emergencies that may arise.		Know location, number and kind of equipment available. Know location, number, and class of overhead available. Know location, number and class labor available. Know location, quantities, and kinds of commissary available. Know location, quantities of other equipment. Know cooperative agreements.	
5. Prepare Reports.			
a. Expense accounts.		Know: (Forms to use. (When to prepare. (Fiscal regulations. (How to compile. (How to operate typewriter. (Where to get information for compiling. (How to check for accuracy. (Where to send completed form. (When to send completed form. (Simple arithmetic	
b. Time slips.		Ditto	
c. Form 26's.		Ditto	
d. Leave slips.		Ditto	
e. Equipment reports.		Ditto	
f. Telephone toll call report.		Ditto	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked:	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
g. Keep office log up to date.		Ditto	
h. Compensation forms.		Ditto	
i. Purchase order.		Ditto	
j. Property transfers.		Ditto	
k. Requisitions.		Ditto	
l. Form 858.		Ditto	
m. Rangers' ten-day fire report.		Ditto	
6. Handling Correspondence.			
a. Open mail.		Know limitations.	
b. Stamp and date.		How to do. When.	
c. Read mail.		How to read.	
d. Segregate.		How to do. Filing system.	
e. Answering correspondence.		How to do. Limitations. What letterheads to use. How to operate a typewriter. Know filing system.	
f. Filing correspondence.		Know designation. Know filing system.	
7. Allocation of Work.			
a. Secure job list.		Where and how to secure list.	
b. Prepare individual plan.		How and for whom.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
c. Assign jobs.		Know priority of jobs. Who to assign jobs to.	
d. Check for completion.		Know standards involved.	
8. Maintenance and Use of Promise Card System.			
a. Making new cards.		Know how to make and when.	
b. Filing.		Know promise card filing system.	
c. Use of existing cards.		How to use. When to check to determine if any jobs, reports, etc. are coming up for action.	
9. Maintenance Morale of Protection Force.			
a. Disseminate current events.		What to disseminate. How to disseminate. When to disseminate. Who to furnish current events.	
b. Extending personal courtesies to protection personnel.		When, how and what to do to please men, small favors, etc.	
c. Setting example.		How done.	
d. Show personal interest.		How done.	
e. Build up competitive spirit.		How to do. What jobs can be used.	
10. Study Forest Fire Plan, Guard Handbook.		How to study.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
C. SUPPRESSION.			
1. Location of Fire.			
a. Receive notification.		How to use communication instruments. Know what additional information needed if information received not complete.	
b. Record notification.		Know what information to record, i.e., Time of report. Person and station reporting. Location of fire. Azimuth and vertical reading. Approximate size. Rate of spread. Cover type. Direction fire traveling, etc.	
c. Secure confirmation.		What lookouts to call. What questions to ask.	
d. Check with panoramic pictures.		How to use panoramic pictures.	
2. Dispatch First Action.			
a. Decide unit to send.		Know location of units. Know transportation facilities. Know transportation system, best routes of travel. Know elapsed time standards.	
b. Tools and equipment to send.		Know cover type in which fire is burning. How to apply this information in selection of tools.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations.	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill.
c. Communicate with unit.		How.	
d. Issue instructions.		How to issue brief but complete instructions. What factors to include.	
e. Check receipt of instructions		How to check and what points.	
f. Record action.		When, where, what action to record.	
3. Make Check.			
a. Decide with whom to check.		Know communication system. Possible sources of information. How to use visibility maps.	
b. Communicate with information source.		How to communicate. What questions to ask. How to evaluate answers.	
c. Record information secured.		How, when, and where. What to record.	
d. Interpret information.		How to interpret.	
e. Take additional action if necessary.		Know how to calculate probabilities, factors involved. Know where to secure additional forces, equipment, other facilities if necessary. Know when to dispatch these forces, etc.	
f. Record additional action.		How, when, where, and what to record.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
4. Inform Superiors.			
a. Give information on fire.		What to tell them. How to tell them. How to use communication system. Where superiors are located.	
5. Secure Special Forecasts.			
a. Compile local data.		Know what is pertinent. How to compile. Code system used.	
b. Transmit through proper channels.		How, where, when.	
c. Request special forecasts.		How to request and when.	
d. Receive special forecasts.		How to receive. How to use typewriter.	
e. Interpret special forecasts.		Knowledge of Weather Bureau nomenclature. How to evaluate.	
f. Apply special forecast.		Know how to evaluate. Know the significance of high winds, low humidities, high temperatures, etc. and what action to take.	
g. Relay special forecasts.		Who to furnish. How to communicate.	
6. Provide "Cover Up."			
a. Contact personnel.		Who to contact. How.	
b. Arrange transportation.		Needs and where available.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
c. What positions to "cover up."		Knowledge of fire plan. Knowledge of fire danger meter. Class of organization required, etc.	
d. Dispatch cover up.		Know routes of travel. Know positions to be cared for.	
7. Handling Fire Information.			
a. Request and receive.		Know sources. How contacted. What, when and when to request.	
b. Record information.		What, when and where to record.	
c. Transmit information.		To when and what to transmit.	
8. Prepare and Maintain Progress Map and Charts of Fire.			
a. Consolidate information.		Where obtained and what information to use.	
b. Enter on maps, charts.		Proper forms and symbols to use. What to enter. When to enter.	
9. Establish and Maintain Communication to Fire.			
a. Determine needs.		Know existing facilities. Probable needs.	
b. Initiate action.		How, what, and whom.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
c. Make checks.		How to make and what schedules to arrange.	
10. Report Making on Fire.			
a. Collect data.		What data to collect. What sources available. When, and how.	
b. Record data.		How to make out fire report. How to operate typewriter. Know elapsed time standards.	
c. Transmit data.		When, to whom, what, and how.	
11. How to Suppress a Fire.			
a. Size up.		Know all elements involved.	
b. Select point of attack.		Know what elements involved.	
c. Select tools.		How to select tools.	
d. Locate line.		Know principles of line location.	
e. Construct line.		Know principles of line construction.	
f. Mop-up fire.		Know principles of mop-up.	
g. Patrol fire.		Know principles of patrol.	
h. Use of tools.		How to use such tools as axes, McLeod, brush hooks, etc.	

ANALYSIS OF PROTECTIVE ASSISTANT'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
i. How to handle men:		Know principles of organization. How to keep men working. How to keep up their spirits, and morale in spite of hardship, fatigue, etc. Leadership.	

NOTE: This analysis may be used for the position of Ranger District Dispatcher.

ANALYSIS OF TANK TRUCK OPERATOR'S POSITION

INDIVIDUAL

TRAINING INVENTORY CHECK LIST

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required	Trainee's Present Knowledge and Skill
A. MAINTENANCE TRUCK.			
1. Check Truck.		How, when and where to check truck.	
2. Servicing.		How, when and where to service truck.	
3. Making Minor Repairs.		Knowledge of simple mechanics. Knowledge of what constitutes minor repairs.	
B. MAINTENANCE OTHER EQUIPMENT.			
1. Check Equipment and Inspect.		How, when and where and what equipment to check, and inspect.	
2. Servicing and Testing Equipment.		How, when, where, to service and test equipment. Knowledge of mechanics. Knowledge of when equipment is maintained properly.	
3. Reconditioning equipment.		How to recondition.	
C. DRIVING TRUCK.			
1. Steering.		How to steer.	
2. Shifting gears.		How to shift, when to shift, and care in shifting.	

ANALYSIS OF TANK TRUCK OPERATOR'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
3. Safety.		Safety requirements. What the motor will do and what truck will stand without being damaged.	
4. Placement of Truck for Fire Attack.		Knowledge of fire suppression technique. Knowledge of fire behavior.	
5. Laws Regulating Driving.		Knowledge of State driving laws.	
D. RECORDS AND REPORTS.			
1. Operation Records.		How, what, and when to keep records and make reports on motor and pump operation.	
E. FILLING AND EMPTYING TANK.			
1. Operation of Primer.		Mechanism of priming device. Safety of priming mechanism.	
2. Operation of Valves and Pump.		How and what valves to operate in the suction and discharge of water.	
3. Keeping Correct Water Pressure in Hose Line.		How to use discharge tables.	
4. Attaching, Detaching Suction Hose.		How to attach. How to detach.	
5. Attaching, Detaching Discharge Hose.		How to attach. How to detach.	
F. HOSE LAYS.		Knowledge of all possible combination of hose lays. Where they may be used effectively in fire suppression. How to make lays.	

ANALYSIS OF TANK TRUCK OPERATOR'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
G. USE OF NOZZLES.		Knowledge of all types of nozzles and where they are most effective.	
H. USE OF WATER.		Where to apply to be effective. What nozzle tips to be used, under different conditions of cover. How to conserve water.	
I. CONTROL FIRE.			
1. Size-up of Fire.		Elements to be considered and how to evaluate.	
2. Making the Attack.		Vulnerable point of attack. How to apply water, hose lays needed, etc.	
3. Controlling.		How to apply water to fire.	
4. Mopping up.		What constitutes mop-up. How to effectively use water in mop-up work. When a fire can be considered mopped up.	
5. Patrol.		What constitutes patrol. How long to patrol.	
J. CLEANING HOSE.		How to clean. Equipment to use.	
K. STORAGE HOSE.		How to store.	
L. TRAINING.			
1. Use of Hand Tools.		Knowledge of teaching methods. How to use tools correctly.	

ANALYSIS OF TANK TRUCK OPERATOR'S POSITION (Cont'd)

Jobs and Operations	Training Needs as Checked	Knowledge and/or Skill Required.	Trainee's Present Knowledge and Skill
2. Inspection Hand Tools.		Knowledge of teaching methods. How to inspect tools correctly.	
3. In Hose Lays.		Knowledge of different hose lays. Teaching methods best suited to teach hose lays. Organization necessary to effect rapid and skillful handling of hose in the different lays.	
4. In Use of Water.		Knowledge concerning use of water. Teaching methods used to train in the effective and proper use of water.	
5. Reel Man.		Knowledge of reel man's job and best teaching methods to be used to train reel man.	
6. Hose Man.		Ditto.	
7. Nozzle Man		Ditto.	
8. Crew Organization.		Knowledge of crew organization and what is the best method to be used to train crew in organizational effort. How to use method.	
9. Reconditioning Equipment, Axes, Pulaski, etc.		Knowledge of points to be considered in reconditioning. How to teach reconditioning equipment such as axes, etc.	
M. STUDY FOREST FIRE PLAN AND GUARD HANDBOOK.		How to study.	

LESSONS PLANS INVOLVING

FOUR STEP METHOD OF INSTRUCTION.

INSPECTION

1. Instruction Topic:	Inspection of axe.
2. Instruction Units:	Inspection of handle. Inspection of head.
3. Limited to:	Inspection of handle and head of axe.
4. Class:	8 inexperienced men.
5. Location:	Field.
6. Material:	9 double bitted axes, 9 single bitted axes.
7. Estimated time:	30 minutes.

Lesson 1 - Inspection of handle.

STEP I

Brief statement of historical background of axe. Species of material in handle. Present day use. Why axe in perfect condition is important.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Smoothness of handle. 2. Paint brand. 3. U.S.F.S. brand. 4. Straightness. 5. Strength. 6. Tightness.	Demonstrate how to test for and explain importance of each of the points listed in the inspection of the handle.

STEP III

Have each member go through inspection of an axe handle. Assist and correct where necessary.

STEP IV

Assign single bitted axe and have each member make inspection of handle, explaining principles involved as he makes the inspection.

Lesson 2 - Inspection of head.

STEP I

Brief carry-over statement from Lesson 1, including types and weights, difference between single bit and double bit axe.

STEP II

Operations or Inspection Points	Plan for Instruction
1. F.S. stamp on blade. 2. Edge of bit. 3. Bevel of bit. 4. Dressing on blade. 5. How to determine if properly hung. 6. Wedging. 7. General condition. 8. Eye.	Demonstrate and explain how to test for each of the points listed.

STEP III

Have each member go through inspection of axe head. Assist and correct where necessary.

STEP IV

Assign single bitted axe to each member and have each inspect the axe for all points listed under Lessons 1 and 2, each trainee explaining the principles involved as he carries forward his inspection.

1. Instruction Topic:	Inspection brush hook.
2. Instruction Unit:	a. inspection handle. b. inspection blade.
3. Limited to:	Inspection handle, inspection blade.
4. Class:	8 inexperienced men.
5. Location:	Field.
6. Materials:	9 new brush hooks, old brush hooks.
7. Estimated time:	30 minutes.

Lesson 1.- Inspection handle.

STEP I

Brief introduction of subject of inspection and use of brush hook.

STEP II

Operations or Instruction Points	Plan for Inspection
1. Smoothness. 2. Paint brand. 3. Straightness. 4. Strength. 5. Tightness of eye. 6. U.S.F.S. brand.	Demonstrate how to inspect for each point listed and explain as inspection is demonstrated.

STEP III

Have each member of group inspect the handle. Assist and correct where necessary.

STEP IV

Each member describes his actions as he inspects the handle of a brush hook.

Lesson 2 - Inspection blade.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instruction
1. F.S. die stamp. 2. Edge. 3. Wedge. 4. Eye. 5. Rivets. 6. Wear. 7. Dressing.	Demonstrate how inspection is made for each listed point and explain as the inspection of the blade is demonstrated for each point.

STEP III

Give each trainee a new brush hook and have him inspect the blade. Assist and correct where necessary.

STEP IV

Assign each trainee an old brush hook and have each make a thorough inspection of the handle and blade, each explaining meanwhile the principles involved as the inspection proceeds.

1. Instruction Topic:	Inspection cross-cut saw.
2. Instruction Unit:	Inspection cross-cut saw.
3. Limited to:	Inspection cross-cut saw.
4. Class:	6 to 8 inexperienced men.
5. Location:	Field.
6. Material:	2 cross-cut saws, one old and one new.
7. Estimated time:	30 minutes.

STEP I

Brief outline of use and value of saw and need for inspection.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Kinks in blade. 2. Condition of cutting teeth. 3. Condition of rakers. 4. Set. 5. F.S. die brand. 6. Paint brand. 7. General condition.	Demonstrate how to inspect for the points listed. Explain the importance of checking for each point.

STEP III

Have members individually inspect saw. Assist and correct where necessary.

STEP IV

Have members individually inspect an old saw for the points listed above, each explaining principles involved to the members of the group as he goes through inspection.

1. Instruction Topic:	Inspection McLeod tool.
2. Instruction Units:	a. inspection handle. b. inspection blade.
3. Limited to:	(a) and (b) above.
4. Class:	8 inexperienced men.
5. Location:	Field.
6. Material:	9 McLeod tools new, and 9 old.
7. Estimated time:	30 minutes.

Lesson 1 - Inspection handle.

STEP I

History of McLeod tool, etc. Use and need for tool in perfect condition.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Smoothness. 2. Paint brand. 3. U.S.F.S. brand. 4. Straightness. 5. Strength.	Demonstrate how to inspect for and explain why it is necessary to make sure each point is fully covered.

STEP III

Assign McLeod tool to each member and have him go through inspection of handle. Assist and correct where necessary.

STEP IV

Assign old McLeod tool to each member and have each go through inspection of handle.

Lesson 2 - Inspection of blade.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Sharpness. 2. Bevel of edge. 3. F.S.die. 4. Condition. 5. Temper. 6. Teeth. 7. Weakness and general condition.	Demonstrate and explain how to inspect for each of the points listed.

STEP III

Assign a McLeod tool to each member and have each go through inspection of blade. Assist and correct where necessary.

STEP IV

Assign an old McLeod tool to each member and have each go through complete inspection of the handle and blade, each explaining meanwhile to the group the principles involved as he goes through the inspection.

1. Instruction Topic:	Inspection of one gallon canteen.
2. Instruction Unit:	How to inspect a one gallon canteen.
3. Limited to:	How to inspect a one gallon canteen.
4. Class:	6 to 8 men, inexperienced.
5. Location:	Field.
6. Material:	1 canteen for instructor and each member of class.
7. Time required:	30 minutes.

STEP I

Brief introduction.

Questions: How is water carried by men on a fire line?
Why are canteens used?
Should canteens be inspected before being used?
Why?
Should each one of us know how to properly inspect a canteen?

STEP II

Operations or Instruction Points	Plan for Instruction
1. Container.	Take canteen and look it over and feel for dents or injuries.
	Explain that dented or injured canteens often leak; also, do not hold full capacity; do not present a good appearance.
	Remove cap. Look inside to observe condition (corrosion, etc.). Smell of interior to determine cleanliness, then blow into it causing pressure to form in canteen, hold pressure a few second as a check for leaks.

Operations or Instruction Points	Plan for Instruction
	Explain if pressure diminishes, canteen leaks. Sometimes it is possible to detect leak by hearing escape of air.
2. Neck and cap.	Inspect cap for condition of threads and see that cap is not dented or bent. Note that cap has gasket and that it is in serviceable condition.
	Explain that threads must not be injured as cap must screw down firmly on neck. Gasket must be in good condition so that no leaks occur.
3. Cover.	Turn canteen about to note condition of cover and to see that it bears the Forest Service shield.
	Explain that the cover should not be torn or ripped as its purpose is to keep water cool, and to present a good appearance. (New canteens have U.S.F.S. moulded in the side of the canteen which can be seen by looking inside.)
4. Strap.	Inspect strap to see that it is strong, with no cuts or torn places. That it will move freely through the keepers and is long enough for canteen to be carried on the back. Remove knots, if any.
	Explain that strap should not break while in use, as it is very inconvenient to carry canteen without strap. Canteen keepers should not be bent or broken as strap should move freely through them so that canteen can be carried on the back. Knots must be removed so that complete inspection can be made of strap.

STEP III

Give each trainee a canteen and have each separately inspect it for points listed in Step II. Assist and advise if necessary.

STEP IV

Have each trainee go through the complete inspection of the gallon canteen, each explaining meanwhile the principles involved in his inspection.

1. Instruction Topic:	Inspection of shovel L.H.R.P.
2. Instruction Units:	(a) inspection handle. (b) inspection shank. (c) inspection blade.
3. Limited to:	Inspection of handle, shank, and blade.
4. Class:	8 inexperienced men.
5. Location:	Field.
6. Material:	9 L.H.R.P. shovels (new), 9 old.
7. Estimated time:	30 minutes.

Lesson 1 - Inspection handle.

STEP I

Briefly give history of shovel, importance in fire work and why the design has not radically changed.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Smoothness of handle. 2. Grain of handle. 3. Paint brand. 4. U.S.F.S. brand. 5. Straightness. 6. Strength. 7. Balance.	Demonstrate and explain how to inspect for the points listed opposite.

STEP III

Have each member inspect for the points listed above. Assist and correct where necessary.

STEP IV

Assign each member an old shovel and have him inspect for the points listed under Step II.

Lesson 2 - Condition of shank.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Rivets in shank. 2. Shank strips flush with handle. 3. Shank strips broken.	Demonstrate and explain how to inspect to determine if the shank is in proper condition.

STEP III

Assign each member a shovel and have him inspect the shank. Assist and correct where necessary.

STEP IV

Assign each member an old shovel for inspection of shank.

Lesson 3 - Inspection of blade

STEP I

Brief bridge over from Lessons 1 and 2.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Edge. 2. Temper. 3. Wear. 4. Dressing. 5. F.S.die brand. 6. Cracks. 7. General condition.	Demonstrate and explain how inspection is carried forward to cover the points listed.

STEP III

Assign shovel to each member and have him inspect blade for the points listed. Assist and correct where necessary.

STEP IV

Assign each member an old shovel and have each go through the inspection of the handle, shank, and blade, meanwhile explaining inspection principles involved as he goes about doing the job.

1. Instruction Topic:	How to make an inspection.
2. Instruction Unit:	How to make an inspection of a suppression squad.
3. Limited to:	Inspection of suppression crew, plus equipment.
4. Class:	5 men who are to be suppression foremen.
5. Location:	Field.
6. Material:	Suppression truck fully equipped, 10 crew members, truck driver. 1 trained suppression foreman.
7. Estimated time:	4 hours.

STEP I

Short talk to group to secure their attention and interest in the lesson, their curiosity and desire to learn how to make a good training inspection.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Loading.	Ask the suppression foreman to have his men get on the truck as though they were going to a fire. Have suppression foremen correct mistakes made and have crew members repeat loading operations.
2. Unloading.	Have suppression foreman unload his men and line up to secure tools for a fire burning in a given type. Have suppression foreman correct his men in this job if necessary. Note: Following is a diagrammatic sketch of men unloaded and ready to receive equipment.

Operations or Instruction Points	Plan for Instructions
	suppression foreman x ////////x crew members truck x 1st leader second leader truck front The first leader should lay the tools, handlesfirst, on the floor of the truck to the rear. The second crew leader will select tools for men and hand each man kind of tool previously arranged.
3. Getting ready to proceed to fire.	Have suppression foreman line up men in readiness to go to fire. Note: Following is a diagrammatic sketch of men in readiness to go to fire. truck front truck 1st leader x //////// 2nd leader x x suppression foreman Suppression foreman will correct where necessary.
4. Inspection of men and equipment.	Have suppression foreman make an inspection of his men, including equipment. Suppression foreman will do this about as follows: He will have crew members do a right face and beginning with the first leader, make an inspection of the men as to: (a) adequency of shoes. (b) proper clothes for job. (c) tools for job. (d) physical fitness of men. (e) cleanliness and neatness.

Operations or Instruction Points	Plan for Instructions
	The suppression foreman following his inspection of personnel readiness, will fall back into the position indicated in the above sketch and will request each man, beginning with the first leader, to come before him and for each man to inspect the particular tool he is carrying. The suppression foreman will assist and make such correction as becomes necessary. Following this inspection, the crew should be lined up as follows:

truck	truck front	2nd leader	//////	1st leader	suppression foreman
		x		x	x

5. Safety in carrying tools.	The suppression foreman will start his crew to dummy a fire and will note how each is carrying the tool, distance between men, etc. He corrects where necessary.
6. Use of tools.	Suppression foreman will have his crew individually demonstrate the use of tools. He will correct and assist where necessary. Note: Use of tools above will provide demonstration in scraping, raking, throwing dirt, cutting brush, felling snag, etc.
7. Technique of fire fighting.	Suppression foreman will assign each member of the crew certain problems, such as line location, line construction, initial attack, mop-up, patrol, etc. to demonstrate and explain the correct answer for.

Operations or Instruction Points	Plan for Instructions
	He will correct and assist them in the solution of these problems. Suppression foreman, after crew has replaced tools , will give crew a short talk on the result of his inspection, strong and weak points and what must be stressed in future. Releases suppression crew.
8. Inspection truck.	Suppression foreman will have truck driver make an inspection of t ruck. He will correct and assist where necessary. Releases truck driver.

During the above demonstrations, the training group will keep notes on what they observe.

STEP III

By group discussion, bring out the fundamental points involved in the inspection of a suppression crew. If the group is uncertain on some of the points, amplify and explain.

STEP IV

Give a written examination on the inspection of suppression crew.

USE, OPERATION OF TOOLS AND EQUIPMENT.

1. Instruction Topic:	How to fell a tree with an axe.
2. Instruction Units:	(a) position hands, feet, body. (b) how to fell tree with axe.
3. Limited to:	(a) and (b) above.
4. Class:	5 inexperienced men.
5. Location:	Field - timber.
6. Equipment:	6 D.B. axes.
7. Estimated time:	4 hours.

Lesson 1 - Position of hands, feet, and body.

STEP I

Introduction to the lesson, history of axe, use in fire suppression work.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Position of hands.	Demonstrate the position of the hands on the axe handle and how to grasp the handle. Explain why it is necessary to hold the axe properly.
2. Distance from tree.	Demonstrate how to determine the correct distance to stand with relation to the tree when felling it.
3. Position of feet.	Demonstrate correct position of feet. Show how this position may be changed due to topographic features on side hill, level ground, etc.
4. Safety factor.	Demonstrate the need of glancing back to check distance of men, also the need to look for overhanging branches, etc. before taking swing.

STEP III

Have each member of group go through points taught. Assist and correct where necessary.

STEP IV

Move to new location where topography is different and have each member of group go through points taught unassisted.

Lesson 2 - Felling a tree.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points.	Plan for Instructions
1. Determine where tree can be felled.	Explain that in felling a tree with an axe it may be felled in any location desired, other factors being equal, if it stands perpendicular, but the timber faller has a more and more limited choice where the tree may be laid down as the lean or load of the tree bole becomes more pronounced. Demonstrate how to use the axe in determining where the tree may be felled. Explain and demonstrate that even with a tree that has a decided lean, there still remains a choice, though limited, on where the tree may be felled. Select location on where tree may be felled.
2. Back swing.	Demonstrate back swing when making a cross cut with axe; when making a chipping cut with axe.

	Point out the movement of the hands on the handle when going through the two distinct types of back swing.
3. Forward swing.	Demonstrate forward swing for cross cutting stroke and for chipping stroke. Point out movement of hands on handle for these strokes.
4. Under cut.	Demonstrate where to place the under cut to fell the tree in the bed selected. Point out that the lean of the tree determines to a large degree the depth of the under cut. Make the under cut and illustrate with use of axe when under cut is made correctly. Complete under cut.
5. Back cut.	Demonstrate back cut and proceed to make back cut and fell tree. Show how in some instances wood must be held on one corner of cut to pull tree into position to fall where wanted. Complete back cut and fell tree.

STEP III

Have each member of group fell a tree that can be felled in 15 minutes of hard work. Have each member explain points brought out in lesson as the progress of the felling job moves forward. Assist and correct as required.

STEP IV

Have one member of the group fell a tree 16" in diameter, explaining meanwhile the principles involved in the job of felling the tree. Question the group to determine if all points in Lesson 1 and 2 have been learned.

1. Instruction Topic:	How to use brush hook.
2. Instruction Unit:	How to use brush hook to cut small brush.
3. Limited to:	How to use brush hook to cut small brush.
4. Class:	6 inexperienced men.
5. Location:	Field where small brush is available.
6. Material:	7 standard brush hooks.
7. Estimated time:	45 minutes.

STEP I

Give short introductory talk, explaining various designs of brush hooks and uses; importance in constructing fire lines through brushy country.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Position of handle.	Demonstrate correct position of hands on handle to maintain balance of tool when in use. Explain why the correct position of the hands is essential for proper control of the tool when in use.
2. Position of feet.	Demonstrate correct position of feet when using brush hook. Explain why correct position of the feet is essential.
3. Position of body.	Demonstrate correct position of body when using brush hook. Explain why it is necessary to hold the body correctly when using the brush hook.

4. Safety factor.	Demonstrate how to make sure no injuries will result from use of brush hook. Explain importance of looking around before work commences to make sure no injury will result to co-worker or self.
5. Swing stroke.	Demonstrate correct method of using a full swing stroke with brush hook and what part of blade is used in cutting small brush, also angle of blade when it meets the brush. Explain importance of care in securing the correct position of blade.
6. Pull stroke.	Demonstrate correct method of using the pull stroke in using a brush hook. Explain the use of the pull stroke and how it is effective in light brush.

STEP III

Assign each member a brush hook and have him go through points mentioned in use of brush hook to cut light brush. Assist and correct where necessary. Practice until all points are thoroughly grasped.

Suggestive Questions

1. What causes a brush hook to sting your hands?
2. What are four dangers in using a brush hook?
3. How do the correct positions effect the work accomplished?
4. How do you protect the blade when cutting light brush.

STEP IV

Move the class to a new location having a different type of brush and have each member, unassisted, demonstrate position of hands, feet, body, use of swing and pull stroke, safety practices, etc. in cutting light brush. Question each member regarding the principles

involved in the use of a brush hook to cut light brush to determine if each has grasped the points taught in the lesson.

1. Instruction Topic:	The back pack pump.
2. Instruction Units:	(a) how to assemble. (b) how to operate.
3. Limited to:	(a) and (b) above.
4. Class:	5 men, inexperienced.
5. Location:	Field.
6. Material:	6 back pack pumps. Water supply.
7. Estimated time:	1 hour.

Lesson 1 - How to assemble.

STEP I

Point out the importance of the use of water in suppressing any kind of a forest fire.

Overhead questions:

1. Have you ever had the experience of suppressing a small fire where the amount of actual work was very small but it was necessary to remain on the fire several hours until it was safe to leave?

2. What would you do if you found you had a back pack pump available?

3. Do you think it would be advisable to know how to use a back pack pump properly?

STEP II

Operations or Instruction Points	Plan for Instructions
1. The tank.	Demonstrate assembling clamps, straps, and lid.
2. Hose and connections.	Demonstrate how the hose is connected to tank and pump with clamps. Explain the importance of clamps being tight.

3. The pump.	Demonstrate by dismantling and assembling, all parts of the pump. Explain function of each part and how to determine if o.k.

STEP III

Have each member of the class dismantle and assemble the back pack pump, giving individual assistance when needed.

Lesson 2 - Use of back pack pump.

STEP I

Bridge over to instruction unit (b). Introduce the new subject "How to operate." Stress the importance of the use of back pack pump in fire suppression work.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to fill.	Demonstrate filling tank. Explain necessity of using clean water.
2. How to carry.	Demonstrate putting pump on back and adjusting straps. Explain the necessity of proper adjustments.
3. How to hold pump and pump water.	Demonstrate position of pump and where to place hands. Pumping movements. Explain necessity of above.
4. Effective use of water.	Demonstrate use of various types of nozzles and sprays for fire burning under different conditions by having fire in grass, pine needles, in snags or logs. Show how to use water effectively.

Explain the great need for conservative use of water.

STEP III

Have each member of the class fill the back pack pump assigned him, place it on his back and operate the pump as above demonstrated. Give individual assistance when necessary.

STEP IV

Have each member of the class assemble, fill, carry, and operate a back pack pump without assistance, meanwhile explaining the principles involved, reasons for operations, procedure, etc. as he goes through the above jobs.

1. Instruction Topic:	The Coleman lantern.
2. Instruction Units:	(a) how to light a Coleman lantern. (b) how to service a Coleman lantern.
3. Limited to:	(a) and (b) above.
4. Class:	5 inexperienced men.
5. Location:	In shop preferably.
6. Material:	6 Coleman lanterns 6 Coleman wrenches 6 extra generators 6 sets of mantles 6 fuel containers 6 funnels 1 Pyrene fire extinguisher (1 qt. capacity)
7. Estimated time:	60 minutes.

Lesson 1 - Servicing

STEP I

Brief introduction into subject.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Filling bowl with gasoline.	Unscrew cap from bowl. Place funnel in hole, pour in fuel and replace cap. Explain necessity of screwing cap down firmly, not to spill gasoline, not to smoke, explosive qualities of gasoline, etc.
2. Care and Replacement of generator.	Demonstrate taking off cap and globe. Use of cleaning wire. Removing and replacing generator. Explain care in using cleaning wire if mantles are in place.

Operations or Instruction Points	Plan for Instructions
3. Installing mantles.	Demonstrate removing remainder of old mantles. Put new mantles in place, tie firmly and cut off string. Light and burn mantles to shape them for use. Explain frail texture of mantles and care necessary in handling light.

STEP III

Give each member of the class a Coleman lantern and have each one go through the steps above demonstrated. Assist as necessary.

Question for essential knowledge.

1. What would you do if you tried to light a Coleman lantern and it wouldn't work?

2. Why is it necessary to replace the fuel cap tightly?

3. Why is it necessary to cut off the excess string from new mantles?

STEP IV

Have each member of the class go through the steps of servicing and lighting a Coleman lantern without assistance.

Lesson 2 - How to light a Coleman lantern.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Pumping air into bowl.	Demonstrate the unscrewing of the pump plunger. Place thumb over air vent, holding lantern firmly with left hand and go through pumping motion. Replace plunger and screw it down firmly.

Operations or Instruction Points	Plan for Instructions
	Explain the importance of making even strokes with pump, why the air vent, and the necessity of screwing down the pump plunger; also, how to keep from getting too high a pressure in bowl.
2. Generating.	Demonstrate how matches are held under the generator to avoid touching the mantles. Explain that the generator must be properly heated before turning on the fuel valve.
3. Opening of fuel valve.	Demonstrate that while holding matches under generator, the valve should slowly be turned to the left. Explain that if the fuel is turned on too rapidly before the gas is properly generated, the mantles may be covered with carbon from the yellow flame. Also, point out danger of causing fire.

STEP III

Furnish each member of the class with a Coleman lantern and instruct the class to go through step by step the above points demonstrated. Assist when necessary.

Question group for knowledge.

1. What would happen if the fuel valve was opened before heating the generator?

2. Why is it necessary to pump up the bowl?

3. Why is it necessary to screw the pump back in place after pumping?

STEP IV

Class lights Coleman lantern without assistance.

1. Instruction Topic:	Operation of Osborne type fire finder.
2. Instruction Units:	(a) leveling fire finder. (b) Orienting. (c) adjustment and use of alidade. (d) reading scales. (e) care of fire finder.
3. Limited to:	Above instruction units.
4. Class:	5 men.
5. Location:	On lookout.
6. Material:	Fire finder complete with map. Dispatcher's map board or diagram of map board.
7. Estimated time:	2 hours.

Lesson 1 - Leveling fire finder.

STEP I

Introduction to subject.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Use of level.	Demonstrate and explain use of level.
2. Leveling three side rails.	Explain that all three side rails must be on a level plane to insure accurate readings. Demonstrate how these may be leveled by use of shims.
3. Where and how to place level.	Demonstrate and explain where to place level on fire finder to determine if it is level.
4. Use of level screws.	Demonstrate and explain the use of the four thumb screws to adjust and level the plates.

Operations or Instruction Points	Plan for Instructions
5. Leveling fire finder.	Demonstrate and explain how to level fire finder.

STEP III

Have trainees level up fire finder. Correct and assist as required.

STEP IV

Trainees go through unassisted.

Lesson 2 - Orienting fire finder.

STEP I

Bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Determine north on map.	Explain orientation and how to determine north on map.
2. Orienting map with respect to azimuth scale on fire finder.	Demonstrate method of placing map on plate so that meridian of the lookout point passes through 0° and 180° on the azimuth plate reading. Demonstrate and explain how meridian of lookout point is laid out on map.
3. Orienting map with respect to topographic features on ground.	Demonstrate how to adjust finder plate to orient the map with known points on the ground. Emphasize the importance of selecting and using one main point for orientation purposes, also importance of checking orientation first thing every morning. Explain importance of checking orientation at time of orienting to determine if oriented correctly with respect to all topographic features.

STEP III

Have trainees go through orientation of fire finder. Assist if necessary.

STEP IV

Trainees go through orientation of fire finder unassisted.

Lesson 3 - Adjustment and use of alidade.

STEP I

Bridge over from Lesson 2.

STEP II

Operations or Instruction Points.	Plan for Instructions
1. How to plumb sights.	Demonstrate and explain adjustment of alidade. Explain that alidade must be in proper adjustment to secure correct fire finder readings.
2. How to adjust cross hairs.	Demonstrate and explain.
3. How to adjust and use tape.	Demonstrate and explain how tape is adjusted; placing of zero on the tape over the pin point which is located on map at the point occupied by the fire finder. Explain the use of the scale on the tape to determine the air line distance to any known point on the ground.
4. How to turn alidade.	Demonstrate and explain.
5. How ti sight correctly.	Demonstrate and explain.

STEP III

Have trainees go through adjustments and use of alidade. Help where necessary.

STEP IV

Trainees go through unassisted.

Lesson 4 - How to read fire finder scales.

STEP I

Bridge over from Lesson 3.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to read azimuth.	Demonstrate and explain.
2. How to read azimuth vernier.	Demonstrate and explain.
3. How to read vertical angle scale.	Demonstrate and explain, being sure to bring out minus and plus angles.

STEP III

Have trainees go through azimuth, vernier, and vertical scale reading. Assist when necessary.

STEP IV

Trainees go through the above without assistance.

Lesson 5 - Care of fire finder.

STEP I

Bridge over from Lesson 4.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Keep clean and clear.	Explain that fire finder must be clean and clear to be of most value. Demonstrate and explain how and why fire finder can and should be moved to miss obstructions in building when sighting on fire.

STEP III

Have trainee lift fire finder to miss obstructions when sighting on fire. Assist when necessary.

STEP IV

With previously prepared questions, test the group either through oral or written examination on the points brought out in Lessons 1, 2, 3, 4, and 5.

1. Instruction Topic:	How to use a falling saw in timber falling.
2. Instruction Units:	(a) assembling, safety practices, position of hands, feet, body. (b) starting strokes, sawing stroke, use of oil wedging, removing saw. (c) falling a snag with a saw.
3. Limited to:	Above points.
4. Class:	6 inexperienced men.
5. Location:	Field, snags available.
6. Material:	1 falling saw, handles, oil wedges, sledge. L experienced timber faller as assistant instructor.
7. Time:	3 hours.

Lesson 1 - Assembling, safety, position of hands, feet, body.

STEP I

Brief introduction in use of falling saw in felling snags, importance of falling saw in fire suppression work.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Assembling.	Demonstrate how to attach handles to saw.
2. Safety practices.	Explain safety practices to group. Demonstrate.
3. Position of hands when starting cut.	Demonstrate the position of the hands on handle and saw when starting the cut. Explain why only one of the hands is on the handle with the other grasping the back of the saw blade.

Operations or Instruction Points	Plan for Instructions
4. Position of hands while sawing.	Demonstrate the position of the hands while sawing. Explain that after the saw cut is deep enough to support the saw, that both hands are placed on the handle to get full benefit of the use of the hands in pulling and in rocking the saw in the cut to get the most effective cutting action of the teeth.
5. Position of feet when starting the cut and when sawing.	Demonstrate the position of the feet when starting the cut and also after cut is deep enough to support the saw. Explain why the feet should be in the positions demonstrated - feeling of comfort and naturalness.
6. Position of body.	Demonstrate the position of the body when starting the cut; after the cut is started. Explain the bend of the body is determined largely by the height of the saw cut above the ground on which the faller is standing.

STEP III

Have group practice points listed above. Assist and correct where necessary. NOTE: Do not have men saw more than is necessary to grasp the above fundamentals.

STEP IV

Same as above but unassisted.

Lesson 2 - Starting stroke, pulling and retreating strokes, use of oil, wedging, removing saw.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Starting stroke.	Demonstrate the starting stroke. Explain the reasons for taking rather short strokes when starting the saw.
2. Pull stroke and retreating stroke.	Demonstrate the pull stroke first. Explain that the pull stroke is the cutting stroke and that the man going through the pull stroke simultaneously with the retreating "stroker" does the most work by pulling the teeth of the saw through the wood; that retreating "stroker" should not ride the saw, push it too hard but that he should get the feel of the wishes of the pull "stroker" as telegraphed by him and act accordingly. Emphasize importance of dual rhythm and coordination in stroking action. Explain length of stroke. Demonstrate.
3. Use of oil.	Demonstrate use of oil, quantities to apply. Explain how often to apply oil, kind of oil used.
4. Wedging.	Demonstrate opening kerf with wedge. Note: Do not go into a discussion of use of wedge in forcing tree to fall in position desired.
5. Removing saw.	Demonstrate how to remove saw from kerf with wedge in place. Explain importance of removing saw to prevent kinks, ruining the set, etc.

STEP III

By questions determine if group has learned the points given in Lesson 2.

STEP IV

Have two members of the group go through the points taught in the above lesson by felling a snag 6 feet high, the members explaining to the group meanwhile the principles involved, reasons for the several operations, etc.
Note: The reason for selecting a snag only 6 feet high is because felling principles such as undercut, etc. do not enter into the test.

Lesson 3 - Falling a snag with a saw.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Determine limit of choice where snag may be felled; select desired location within limitations.	See lesson discussing use of axe to determine limit of choice. Note: Members of this group should be given above lesson before being given this step.
2. Under-cut.	Demonstrate how to saw under cut. Show trainees how to use handle of saw in sighting under-cut. Explain depth of under-cut, i.e., tree with heavy lean towards location of "bed", heavy under-cut; tree with lean directly away from location of "bed", light under-cut. Explain why. With axe, demonstrate chipping under-cut. Explain and demonstrate use of axe in sighting finished under-cut.

Operations or Instruction Points	Plan for Instructions
3. Back-cut.	Demonstrate vertical position relation of back-cut with under-cut. Explain reasons for and why back-cut should be above under-cut a certain number of inches - i.e., prevents snag from kicking back, snag from sliding off stump, creates a leverage which causes snag to fall sooner.
4. Sawing-cut.	Demonstrate how to do. Explain reasons for sawing corners - i.e., prevents possible dangerous "barber chairs", makes it possible to break more wood by wedging. In some instances, a corner must be cut and the other corner held due to a wind coming up between the time of completing the under-cut and the felling of the snag, etc.
5. Use of wedge.	Demonstrate placement of wedge or wedges. Explain how to make them stick in pitchy snag - i.e., dry dirt on wedge. Explain wedges needed to raise tree from saw and as an aid in "tipping" snag; also, in forcing snag to fall where intended.
6. Removing saw.	Same as previous lesson.
7. Wedging over.	Complete falling snag.

STEP III

Select a snag and by rotating in groups of two, have each man take part in felling a snag. Assist and correct as necessary.

STEP IV

Same as above but without assistance.
Group discussion of points taught.

1. Instruction Topic:	Operation of Hauck torch.
2. Instruction Unit:	Operation of Hauck torch.
3. Limited to:	Carrying and generating Hauck torch.
4. Class:	6 inexperienced men.
5. Location:	In grass or pine needle cover.
6. Material:	6 Hauck torches, fuel, wrenches, 1 Pyrene extinguisher.
7. Estimated time:	1 hour.

Lesson 1 - Carrying torch.

STEP I

Uses torches are put to in fire work, need for carrying without fatigue or danger.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Harness. 2. Pads. 3. Hose clamps tight. 4. Valves tight. 5. Safety.	Demonstrate and explain each instruction point, finally showing how torch is to be carried.

STEP III

Have trainees demonstrate the points given above and practice carrying torch. Assist and correct where necessary.

STEP IV

Trainees demonstrate without assistance.

Lesson 2 - Operation of Hauck torch.

STEP I

Bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Filling. 2. Pressure. 3. Heating generating coil. 4. Opening valave. 5. Lighting burner. 6. When is it generating properly? 7. Cleaning generator.	Demonstrate each point listed and explain to the class as each point is carried forward.

STEP III

Have class demonstrate the above points. Assist where necessary.

STEP IV

Have each member of the class go through the points taught in Lessons 1 and 2 unassisted; also, explain the principles involved and the reasons for the operations to the remainder of group.

1. Instruction Topic:	How to use McLeod tool in constructing fire line.
2. Instruction Unit:	How to use McLeod tool in constructing fire line bear clover cover.
3. Limited to:	Position of hands, feet, body, use of blade and rake, safety factors.
4. Class:	6 inexperienced men.
5. Location:	Field - bear clover cover.
6. Materials:	7 McLeod tools.
7. Estimated time:	45 minutes.

STEP I

Brief history of tool, its uses and value in suppression work.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Position of hands.	Demonstrate the position of the hands on the handle as the motions are made in the use of the McLeod. Explain the importance of holding the tool so it is well balanced during the cutting, scraping or raking operations.
2. Position of body.	Demonstrate the various positions the body assumes during the operations listed above. Explain the need for practice to develop the body rhythm that is essential to prevent fatigue and to get the most effective work.
3. Position of feet.	Demonstrate the position of the feet in scraping, cutting, and raking.

Operations or Instructions Points	Plan for Instructions
4. Use of blade in cutting bear clover.	Demonstrate the use of cutting edge in clearing fire line of bear clove. Explain the importance of operating the cutting edge at an angle to secure most effective use of blade in cutting bear clove.
5. Use of blade in scraping.	Demonstrate scraping line. Explain as operation proceeds.
6. Use of rake.	Demonstrate raking line. Explain as operation proceeds.
7. Safety.	Demonstrate the need for precautions in using McLeod. Explain the need for safety.

STEP III

Have each member demonstrate and explain the instructional points brought out. Assist and correct where necessary.

STEP IV

Move to new location and have class demonstrate construction of fire line with McLeod tool.

Note: Above lesson outline can be used for teaching use of McLeod tool in pine needle cover, grass or light brush with but few changes.

1. Instruction Topic:	Power grinder.
2. Instruction Unit:	Setting up and operating power grinder; taking down and packing.
3. Limited to:	Setting up and operating power grinder; taking down and repacking.
4. Class:	5 inexperienced men.
5. Location:	Field.
6. Material:	One power grinder with equipment box.
7. Estimated time:	2 hours.

STEP I

Brief introduction in the use of the power grinder.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to unpack and set up.	Demonstrate unpacking and setting up. Explain that the grinder should be as level as possible.
2. Check oil level.	Demonstrate how to check oil level. Explain when oil should be changed.
3. Gas level and fuel line.	Demonstrate how to check gas level, fuel line; also, how to fill gas tank, care exercised, etc.
4. Set carburetor.	Demonstrate how to set carburetor. Need for setting it 1/2 turn open before starting motor.
5. Starting motor.	
(a) choke.	Demonstrate how to choke by removing air cleaner and closing intake pipe with hand.

(b) starting motor.	Demonstrate how to start motor by stepping on starter pedal and giving a quick downward shove. Explain drive belt may be removed if motor is difficult to start.
(c) replace air cleaner.	Demonstrate how to replace air cleaner.
(d) oil valve rocker arms.	How to oil valve rocker arms.
(e) securing desired speed.	Demonstrate how speed of motor can be governed.
6. Correcting "shifting" grinder.	If grinder has tendency to move, demonstrate how this can be corrected by shifting position of frame so motor sets solidly on ground.
7. Stopping motor.	Demonstrate.
8. Repacking in case.	Demonstrate.

STEP III

Have students unpack, set up, operate, and repack grinder. Question all members of group to determine if they have grasped the points taught.

STEP IV

Have each student unpack, set up, operate, and repack the grinder unassisted. Have each student explain the principles and operations involved as he goes through the various "doing" jobs.

1. Instruction Topic:	Power pumper (two cycle type).
2. Instruction Units:	(a) how to service pumper. (b) how to attach suction and discharge hose. (c) how to start pumper. (d) how to operate pumper. (e) how to start motor. (f) trouble shooting.
3. Limited to:	The above units of instruction.
4. Class:	5 inexperienced men.
5. Location:	Field water available.
6. Materials:	2 gallons gasoline, 1 gallon oil, suction hose, and 2 lengths of $1\frac{1}{2}$" hose.
7. Estimated time:	2 hours.

Lesson 1 - Servicing pumper.

STEP I

Brief introduction to entire lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Mixture of gasoline and oil.	Demonstrate mixing of gasoline and oil. Explain importance of proper mixture.
2. Filling gas tank.	Demonstrate how it is filled, explain the need for seeing it is filled before operating pumper.
3. Servicing pumper.	Demonstrate how this is done.

STEP III

Through questioning determine if group has grasped the points taught.

STEP IV

Unnecessary.

Lesson 2 - Attaching suction and discharge hose.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Attaching suction hose.	Explain why suction hose must be attached before starting motor, the need for keeping the strainer off the creek bottom, suggest pail for this purpose. Demonstrate attaching suction hose, placing free end in bucket in bed of creek.
2. Attaching discharge hose.	Demonstrate how to attached discharge hose.

STEP III

Have each member of group go through process of attaching suction and discharge hose. By suggestive questions, determine if the points have been learned.

STEP IV

Same as Step III but unassisted.

Lesson 3 - How to start motor.

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Open gas tank shut-off cock.	Show group where this valve is located and demonstrate how to open it.
2. Open water tank shut-off cock.	Show group where this valve is located and how to open it.

Operations or Instruction Points	Plan for Instructions
3. Setting spark lever in starting position.	Show group where this lever is located and demonstrate how to set it in starting position.
4. Opening carburetor needle valve.	Show group position of valve and demonstrate how to open it; explain it should be open one-half to one full turn before starting motor.
5. Opening gauge cock.	Locate gauge cock for group and demonstrate how to open it.
6. Testing grease cup.	Explain to group the need for testing grease cups before starting motor and demonstrate how this is accomplished.
7. How to start motor with starting rope.	Demonstrate starting motor with starting rope.
8. How to choke carburetor.	Demonstrate choking carburetor and explain function of choke.

STEP III

Each member of group will start the motor, assisted where necessary.

STEP IV

Starting of motor unassisted.

Lesson 4 - How to operate pumper.

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Adjust speed of motor.	Demonstrate how to adjust speed of motor by means of the spark lever and carburetor adjustments.

Operations or Instruction Points	Plan for Instructions
2. Temperature of cooling system.	Demonstrate how to adjust water circulation in water jacket by shut-off cock. Explain that the temperature of the water coming from the overflow pipe should be of a temperature the hand can stand.
3. Tightening grease cups.	Demonstrate how this is done, what cups to tighten and that they should be tightened one-fourth turn during every 15 minutes of operation.

STEP III

Have each member of group operate the pumper. Assist and correct where necessary. Ask suggestive questions to determine if all points have been grasped.

STEP IV

Same as III but without assistance.

Lesson 5 - How to stop motor.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. What to do.	Explain the need for burning all the fuel in carburetor before motor stops; prevents oil settling in carburetor. Demonstrate what valves should be shut off to permit consumption of fuel in carburetor before motor stops.

Operations or Instruction Points	Plan for Instructions
2. Discharge hose.	Explain that if pumper is being stopped for a short period and the discharge hose has a large head of water, this hose should be disconnected (unless check valve is used) to release the back pressure so pump will start readily the next run.

STEP III

Have each member of class go through points brought out in stopping the motor. Assist and correct where necessary.

STEP IV

Same as Step III, but unassisted.

Lesson 6 - Trouble shooting.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Spark plug.	Demonstrate how to determine if spark plug is weak. This may be done by removing spark plug and with wire attached, ground plug on motor, operate motor with starting rope and watch spark; if spark is weak or absent, try new plug. If this does not correct, examine breaker points.
2. Breaker points.	Demonstrate and explain by removing screw plug on front face of flywheel and turn flywheel until breaker points come into view. See whether points are adjusted to approximate thickness of thin dime and make sure points are free from dirt and oil.

Operations or Instruction Points	Plan for Instructions
	If this fails to correct trouble, examine wiring.
3. Wiring.	Demonstrate and explain by examining spark plug wires where they enter magneto; the magneto ground on the spark advance arm. Make certain there are no loose connections in the magneto. If this does not correct trouble, make an examination of fuel system.
4. Proper type of fuel mixture.	Demonstrate how to determine if there is a proper mixture of fuel for two cycle type of pumper.
5. Clean carburetor.	Demonstrate how to check carburetor and make certain it is clean of dirt and that no oil has settled in the bottom.
6. Flooded carburetor.	Demonstrate how to tell if the carburetor is flooded. This is done by shutting off gas, removing plug in bottom of crankcase and operating motor.

STEP III

Check to determine if all trainees have taken notes on trouble shooting.

STEP IV

Question each member concerning the points taught to make sure they know the simple things to do in trouble shooting.

1. Instruction Topic:	Use of Pulaski (mattock edge).
2. Instruction Unit:	Use of Pulaski in trenching.
3. Limited to:	Use of Pulaski in trenching in hard ground, soft ground, rocky ground.
4. Class:	6 inexperienced men.
5. Location:	Field.
6. Materials:	7 Pulaski tools.
7. Estimated time:	45 minutes.

STEP I

Brief introduction.

Operations or Instruction Points	Plan for Instructions
1. Position of hands on handle.	Demonstrate the position of hands on handle when taking back and forward swing strokes. Explain why it is essential to have the hands in the correct positions on the handle.
2. Safety.	Explain and demonstrate safety elements; digging, carrying.
3. Position of feet.	Demonstrate the position of feet during back and forward swing strokes. Explain why it is essential to have the feet in the correct position during these strokes. Show how balance is maintained during a complete stroke cycle.
4. Position of body.	Demonstrate position of body during back and forward swing strokes.

	Explain that rhythm in use of Pulaski in trenching is largely a matter of proper body position and muscular coordination, that practice is essential to secure this rhythm.
5. Back swing stroke.	Demonstrate this stroke, making certain that the positions the hands take during this stroke are noted by the group, also of body and feet. Demonstrate this stroke in rocky soil, soft ground, hard ground. Explain the difference in length of back stroke for the different types of conditions.
6. Forward swing stroke.	Demonstrate and explain similar to above.
7. Trenching.	By trenching, demonstrate all points taught above.

STEP III

Have each member demonstrate and explain the points taught. Assist and correct where necessary.

STEP IV

Have each member construct a fire line trench with a Pulaski.

Note: Above lesson plan may be used for teaching trenching with a mattock.

1. Instruction Topic:	How to use shovel.
2. Instruction Unit:	How to use shovel in scraping.
3. Limited to:	How to use shovel in scraping.
4. Class:	6 inexperienced men.
5. Location:	Field, cover of grass or pine needles.
6. Materials:	7 L.H.R.P. shovels.
7. Estimated time:	45 minutes.

STEP I

Brief introduction, discussing uses and purposes of shovel, its value in fire suppression, etc.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Position of hands.	Demonstrate the correct position of hands on the handle when scraping.
2. Position of feet.	Demonstrate position of feet in scraping.
3. Position of body.	Demonstrate position of body.
4. Position of elbow.	Demonstrate the position of the left elbow if left handed and right elbow if right handed when scraping. Explain the value of resting the elbow on the knee.
5. Position of blade.	Demonstrate position of blade when scraping line.
6. Rhythm of muscular movement when scraping.	Demonstrate rhythm of body movement when scraping. Explain the importance of practicing to secure this rhythm, reduces fatigue.

Operations or Instruction Points	Plan for Instructions
7. Scraping.	Demonstrate above points brought out by scraping a section of line.

STEP III

Assign each member a shovel and have each demonstrate points taught during lesson. Assist and correct where necessary. Have group practice scraping line.

STEP IV

Have each member of the group scrap a section of fire line and through questioning him, determine whether or not all points involved in scraping a section of fire line with a shovel were grasped.

1. Instruction Topic:	Sling psychrometer.
2. Instruction Unit:	How to use sling psychrometer; will be broken down into units which will be given as lessons.
3. Limited to:	How to use and read psychrometer and compute humidity from tables.
4. Class:	Five trainees.
5. Location:	Outside.
6. Material:	6 psychrometers, relative humidity tables, sock material. Small quantity of clean water.
7. Estimated time:	30 minutes.

Lesson 1 - Purpose and care of sock.

STEP I

Overhead questions: Introduction to main instruction topic.

1. Have you ever seen a dense fog?
2. What is fog?
3. What does fog do to a fire?
4. Will a fire burn rapidly today?
5. Is there any moisture in the air?
6. How do we know whether there is any moisture in the air?

Explain what we mean by Relative Humidity and in what way we use it.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Purpose of sock.	Explain that the sock is used to form a saturated atmosphere around the bulb.
2. How to install sock.	Demonstrate how to place sock on thermometer and show which thermometer to use.

Operations or Instruction Points	Plan for Instructions
	Explain importance of keeping sock clean. Do not touch sock with fingers any more than absolutely necessary. Explain that grease and dirt prevent free access of water to sock and prevent rapid evaporation.
3. How to wet bulb.	Show how to wet the bulb.
4. Clean water.	Explain importance of using clean water.

STEP III

Have trainees install sock and wet it to make certain points of the lesson have been put over.

STEP IV

Step IV unnecessary.

Lesson 2 - How and where to swing psychrometer.

STEP I

Bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. In the clear.	Explain and demonstrate why psychrometer should be swung in clear.
2. Out of direct sun.	Explain necessity of securing average conditions. Demonstrate how to pick proper location.
3. In average intensity of shade.	Demonstrate how to pick proper location.

Operations or Instruction Points	Plan for Instructions
4. Face breeze. 5. Walk forward and backward.	Explain facing breeze and walking forward and backward to secure proper circulation of air currents and average conditions.
6. How to begin and stop swing.	Explain and demonstrate how to start swing and stop the instrument without damage to the instrument or altering the readings. Question: Ask questions to bring out the necessity for each step.

STEP III

Have trainees swing the psychrometer to see if each one has grasped the main points.

STEP IV

Step IV unnecessary.

Lesson 3 - How to read thermometers.

STEP I

Bridge over from Lessons 1 and 2.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How scale is graduated.	Show and explain the graduations of the thermometer.
2. How mercury rises in column.	Demonstrate by placing hand on bulb.
3. How to hold thermometer so it can be easily read.	Demonstrate where to read the column and explain how to hold thermometer in the light so top of mercury column is easily distinguishable.
4. How to read wet and dry thermometers.	Explain which is wet and which is dry thermometer and how to read them.

Operations or Instruction Points	Plan for Instructions
5. How long to swing.	Explain that thermometer should be swung until minimum reading of wet bulb is reached. Demonstrate.
6. Recheck readings.	Question: Why are recheck readings made?
7. Applying readings to humidity tables.	Demonstrate how to secure relative humidity from readings.

STEP III

The trainees will practice Lessons 1, 2, and 3, and will work out problems in relative humidity.

STEP IV

Give each trainee a psychrometer and a set of humidity tables. Have each member determine what the humidity is by swinging the psychrometer, reading it, transferring the reading to the tables, and coming out with relative humidity reading. Question the group to determine if they have grasped all the points taught in the above lessons.

1. Instruction Topic:	How to use a standard Forest Service compass.
2. Instruction Units:	(a) setting up instrument. (b) taking a line of sight. (c) reading compass. (d) how to run a straight line.
3. Limited to:	Instruction units listed above.
4. Class:	5 inexperienced men.
5. Location:	Field - flat terrain with few scattered trees.
6.Material:	6 standard Forest Service compasses with carrying case and Jacob staff.
7. Estimated time:	2 hours.

Lesson 1 - Setting up instrument.

STEP I

Discuss the use and importance of the compass in locating fires, when first compass was used, etc.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Setting Jacob staff in ground.	Demonstrate how to place Jacob staff firmly in ground. Explain why it is important for it to be nearly perpendicular.
2. Attaching ball and socket joint on Jacob staff.	Demonstrate how this is done. Explain the importance of securely fastening it to the Jacob staff; also the need for the ball and socket joint to fit snugly.
3. Mounting compass on ball and socket joint.	Demonstrate proper method of mounting compass on ball and socket joint.

Operations or Instruction Points	Plan for Instructions
4. Raising sights.	Demonstrate how this is done. Explain the need for care to avoid strain on sights when this operation is being accomplished. Discuss the question of front and rear sight and explain why the front sight is folded below the rear sight when compass is placed in carrying case.
5. Releasing needle.	Demonstrate how needle is released. Explain importance of checking needle to make sure it is swinging freely; also, the importance of raising needle before lifting compass from ball and socket joint.
6. Leveling compass.	Demonstrate how compass is leveled and importance of leveling.
7. Removing compass from Jacob staff. (a) raising needle. (b) lowering sights. (c) lifting from ball and socket joint.	Demonstrate how this is done. Discuss the need for care.

STEP III

Assign each member a compass and have each go through process of setting up instrument. Assist and correct where necessary.

STEP IV

Members set up compass unassisted.

Lesson 2 - Taking a line of sight.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to take a line of sight.	Demonstrate how to line up front and rear sights on target. Explain that rear sight and front cross hair must cut target. Show how to swing compass case without disturbing level of instrument.

STEP III

Have class go through process of taking a sight on a selected target. Assist and correct where necessary.

STEP IV

Class takes sight on selected target unassisted. Check work.

Lesson 3 - Reading compass.

STEP I

Brief bridge over from Lessons 1 and 2.

STEP II

Operations or Instruction Points	Plan for Instructions
1. North and south end of needle.	Explain how to determine and identify the north end of needle. Tell group that north of equator small weight is always on the south end of needle to keep it in balance-magnetic dip.
2. The four quadrants of the compass.	Explain the four quadrants of the compass; the division of each into 90°.

Operations or Instruction Points	Plan for Instructions
3. Declination of compass.	Explain in as simple language as possible why the declination and why it is different in one part of the State than another. Give declination of compass.
4. Which end of needle to use when reading compass.	Explain why reading should be taken beginning at north end of needle. Explain and demonstrate various compass readings.
5. Parallax.	Explain parallax and the importance of looking directly down on the needle to avoid it. Demonstrate how different and incorrect readings may be secured by viewing needle from different angles.
6. Metal on person.	Demonstrate the importance of having the person free of disturbing metals such as iron in hat brim, etc.
7. Importance of checking the level and line of sight of the compass before taking the reading.	Demonstrate the mistakes in readings that may occur when the compass is not level; also, the importance of checking the line of sight, or releveling, if found necessary.

STEP III

Assign compass to each member and have each one give a reading with compass lined on a given target. Assist and correct where necessary.

STEP IV

Same as Step III, but without assistance.

Lesson 4 - How to run a straight line.

STEP I

Brief bridge over from proceding lessons.

STEP II

Operations or Instruction Points	Plan of Instructions
1. How to run a straight line.	Demonstrate how to run a straight line with a given course.

STEP III

Give students a compass course and have them run a straight line.

STEP IV

Assign each student a compass, give each a course to run with a known destination, and have him go through the process of setting up the instrument and running out the course. At the conclusion of this test, question the group to determine if the various points taught in Lessons 1, 2, 3, and 4 have been learned.

1. Instruction Topic:	Operation of tank truck.
2. Instruction Units:	(a) the pumping assembly. (b) servicing tank truck. (c) how to start and operate truck. (d) how to hook up discharge and suction hose. (e) how to fill tank. (f) how to operate pumping unit when pumping from creek to discharge hose. (g) how to operate pumping unit when moving. (h) forms, etc.
3. Limited to:	Above listed instruction units.
4. Class:	5 men.
5. Location:	Field - water available.
6. Material:	1 tank truck fully equipped, black board, chalk, diagram of pumping unit.
7. Estimated time:	3 hours.

Lesson 1 - The pumping assembly.

STEP I

Introduction to tank truck operation.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Diagram of pumping assembly.	Demonstrate by diagram on black board how the entire pumping assembly is built up, and how it operates.

STEP III

Through questions determine if group has grasped the essential points.

STEP IV

With the group gathered at the tank truck, determine through conference and discussion whether or not the fundamentals of the pumping assembly have been grasped.

Lesson 2 - Servicing tank truck.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Grease chassis. 2. Grease pumping assembly. 3. Change oil motor. 4. Fill gas tank. 5. Fill radiator. 6. Check tires, condition, air. 7. Oil chassis, motor. 8. Wash motor, tank truck.	Demonstrate how to do and explain need for being thorough; when to do; records to be kept, etc.

STEP III

By questioning, determine if all points have been grasped.

STEP IV

Not necessary.

Lesson 3 - How to start and operate truck.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Turn on ignition key. 2. Pull out choke. 3. Step on starter. 4. Adjust gas throttle to secure proper motor speed to warm up. 5. Release emergency brake.	Demonstrate how each operation is accomplished. Explain the importance of coordination in operating truck.

Operations or Instruction Points	Plan for Instructions
6. Place foot on foot brake until ready to start.	
7. Release clutch.	
8. Shift into low gear.	
9. Start truck to move.	
10. Steer.	
11. Shift gears after start.	

STEP III

Have each member of group demonstrate the operation of truck. Note: (No member of group should operate a truck who does not know how to drive a passenger car).
Assist and correct as needed.

STEP IV

Same as above but without assistance.

Lesson 4 - How to hook up discharge and suction hose.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Connect suction hose.	Demonstrate how to connect suction hose. Explain the importance of putting the strainer end of hose in bucket to prevent gravel from entering. Also, the importance of having no kinks in suction hose; also, no air leaks.
2. Connect discharge hose.	Demonstrate how discharge hose is connected.

STEP III

Question group to determine if all points were grasped.

STEP IV

Have group connect discharge and section hose.

Lesson 5 - How to fill tank.

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Connecting suction hose.	Demonstrate how this is done; no kinks or air leaks.
2. Placing free end of suction hose in creek.	Demonstrate and explain importance of placing free end of hose in bucket; also, what lift can be expected of pump.
3. Valves to be opened, closed.	Demonstrate what valves should be opened and which closed when drafting to tank.
4. Operating the pump.	Demonstrate how this is done; what pressure to hold on pressure gauge, etc.
5. Tank full.	Demonstrate how to tell when tank is full; how to stop pump; how to put away suction hose.

STEP III

Have each member of group draft water into tank. Assist and correct where necessary.

STEP IV

Same as above but without assistance.

Lesson 6 - How to operate pumping unit when pumping from creek through to discharge hose.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Valves to be opened, closed.	Demonstrate what valves to open, to close.
2. Actual operation of pumping unit.	Demonstrate how to do.

STEP III

Have each member of group demonstrate how to pump from creek through discharge hose. Assist and correct where necessary.

STEP IV

Have each member of the group operate the pump to bring water through the discharge hose; also, have each explain the principles involved, etc. as this operation is being carried forward.

Lesson 7 - How to operate pumping unit when moving.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Valves to open, close.	Demonstrate what valves should be opened and ones to close to pump from tank through to discharge hose.
2. Pumping while moving.	Demonstrate how to put water through the discharge hose with the tanker moving.
3. Live reels.	Demonstrate pumping through live reels when moving.

STEP III

Have each member operate pumping unit while moving.

STEP IV

Test without assistance.

Lesson 9 - Forms

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Motor operations form. 2. Tank truck operations report.	Discuss record keeping and illustrate how to fill out forms.

STEP III

Have each member practice making out forms. Check and assist where necessary.

STEP IV

Give a written test on tank truck forms.

COMMUNICATION

1. Instruction Topic:	Wall telephone.
2. Instruction Unit:	(a) setting up wall telephone. (b) trouble shooting.
3. Limited to:	Setting up wall telephone and trouble shooting.
4. Class:	3 inexperienced men.
5. Location:	Field.
6. Material:	1 wall telephone.(If possible, a phone for each man). 1 ground rod. 1 lightning arrester. 1 fuse. 1 switch. 3 extra arrester blocks and separators. 3 batteries -sufficient wire to connect into live line. 1 blown fuse. 1 switch board.
7. Estimated time:	3 hours.

Lesson 1 - Setting up wall telephone.

STEP I

Brief introduction to entire subject.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Battery hook-up.	Demonstrate battery hook-up; explain the importance of correct battery hook-up and how to check to determine this has been correctly done.
2. Line hook-up.	Demonstrate how line hook-up is made; explain the difference between hooking up to metallic circuit and ground circuit.

Operations or Instruction Points	Plan for Instructions
3. Ground hook-up.	Demonstrate how to hook up ground wire; ground rod.
4. Connection and use of fuse.	Demonstrate the fuse hook-up. Explain its function and emphasize the fact that a blown fuse makes an open line. Demonstrate this point by inserting a blown fuse. Each student will ring and talk with good fuse in place and with a blown fuse in place. Note the difference.
5. Connection and use of lightning arrester.	Demonstrate ringing and talking with arrester block in good condition; with damaged arrester block. Demonstrate how to clean arrester block and emphasize importance of cleaning arrester block after each lightning storm.
6. Switch.	Demonstrate and explain use of switch. Emphasize importance of throwing out switch to protect instrument during lightning storms.

STEP III

Each student will go through the points given above. Assist and correct as necessary.

STEP IV

Question group members on the points taught.

Lesson 2 - Trouble shooting.

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Telephone bell does not ring or rings very weakly when others call.	Explain that the following may be the cause: (a) wire, drop wire, or lead in wire may be broken; short circuit in lightning protection. (b) line wire may be grounded by resting on ground. (c) broken wire in telephone set. Demonstrate the above points.
2. Bell rings frequently without apparent cause.	Explain line may be crossed with some other telephone line.
3. Bells at switching station will ring when calling on only one line.	Explain and demonstrate this may be due to poor ground; also, may be due to too high resistance of wire leading from ground due to wire of too small gauge being used.
4. Ringer will not ring bells of other phone.	Explain that this may be due to line wire, drop wire, or lead in wire being broken; fuse open; short circuited protector blocks; poor ground; broken wire or connection in telephone set. Demonstrate how to check for the above points and what to do.
5. Others cannot hear voice.	Explain that this may be due to batteries being too weak or incorrectly connected; switch hook out of adjustment or contacts poor; wiring connection need cleaning and tightening; transmitter is packed.

Operations or Instruction Points	Plan for Instructions
	Demonstrate how to check for the above points and what to do.
6. Cannot hear others talk.	Explain that this may be due to defective or dirty receiver, receiver switch open or short circuited, switch hook out of adjustment. Demonstrate how to check for the above and what to do.
7. Interruption of conversation.	Explain that this may be due to loose connection on line or ground wire; lines crossed or grounded intermittently; lines swinging against lightning rod on poles; receiver cord partly broken; loose connections in batteries; unsoldered connections at ground rod; bad splice in line wire. Demonstrate how to check for the above and what to do.
8. Generator turns hard.	Explain that this may be due to line wire being grounded; protector block grounded; protector block shorted by lightning strike; wires crossed on metallic circuit; generator needs oil. Demonstrate how to check for the above points and what to do.

STEP III

By questioning the group, determine if they have grasped the above points and thoroughly understand them. Give additional information when necessary.

STEP IV

Have a prepared set of questions and give a written test on the job of trouble shooting.

Note: The above lesson may be shortened to those essentials a guard should know to accomplish simple repairs.

1. Instruction Topic:	Portable telephone.
2. Instruction Unit:	Setting up portable telephone.
3. Limited to:	Setting up portable telephone.
4. Class:	5 inexperienced men.
5. Location:	Field.
6. Material:	5 portable phones, emergency wire, ground rod, knife.
7. Estimated time:	1 hour.

STEP I

Brief introduction to lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Preparing emergency wire.	Demonstrate stripping covering from wire.
2. Connecting wire to phone-line, to ground.	Demonstrate how phone is connected to line, to ground, or in case of metallic circuit to metallic circuit.
3. Making ground connections.	Where only ground line, show how to make good ground connection. Explain importance of good ground.
4. Install batteries.	Demonstrate how to install batteries.
5. Hand set and switch.	Explain use of transmitter and location of switch, etc.
6. Ringer.	Explain how to ring.

STEP III

Each member will set up emergency phone and get it ready for use. Assist and correct where necessary.

STEP IV

Same as Step III but without assistance, although here it would be well for each member as he installs the batteries, makes the ground connections, etc., to explain the principles involved and the reasons for carrying forward the operations in the manner demonstrated.

1. Instruction Topic:	Making an emergency splice in #9 telephone wire.
2. Instruction Unit:	How to make an emergency splice in #9 telephone wire.
3. Limited to:	How to make an emergency splice properly and an understanding of the function of each part of the splice.
4. Class:	6 men, inexperienced.
5. Location:	Field.
6. Material:	#9 telephone wire, cut off in suitable lengths. Supply of sticks for inserting in loop.
7. Estimated time:	30 minutes.

STEP I

1. Why is telephone communication essential for fire control on the Forest?
2. Are there occasions when the line may be broken?
3. Do you always have the necessary tools to make a standard splice?
4. Would it be a good idea to know how to make an emergency splice, without the use of tools?

STEP II

Operations or Instruction Points	Plan for Instruction
1. Making the first loop.	Demonstrate amount of free end wire to bend back and how to form the loop. Explain loop is approximately 1-1/2" in diameter. Two turns of free end around main line to form the loop. Note: There is about 16" of end wire that is not used.

Operations or Instruction Points	Plan for Instructions
2. The second loop which forms a mechanical connection.	Demonstrate how the free end of the second wire is slipped through the first loop, and the second loop is made in the same manner as the first.
	Suggested Questions: (a) Do you believe this splice will pull apart on account of the weight of the wire? (b) Will this splice make a good electrical connection?
3. Cross free ends and wrap firmly around opposite main line. (Insert a short stick in loop to help to hold wire).	Demonstrate how to use stick in order to hold splice securely. How to close free ends of wire and wrap firmly to opposite main line to make electrical connection. Explain the reason for slack left in wires that cross over. Questions: (a) Which part of the splice carries the mechanical load? (b) Which part of the splice makes the electrical connection? Explain that a good temporary connection is important. Neatness unimportant. Will be replaced with standard splice at first opportunity.
4. How to obtain slack for making an emergency splice out on the job.	Explain that Forest Service lines are constructed with considerable slack between hangers. Sufficient wire must be pulled through hangers before attempting to make splice. Occasionally a hanger must be loosened to obtain sufficient slack.

STEP III

Have members of the class make an emergency splice. Supervise and give individual assistance as needed.

Questions for checking essential knowledge:

(a) What might be the result if, in place of leaving slack in our wires that cross over, we pull them up tight?

(b) What part of the splice makes the electrical connection - carries the weight?

(c) What is the most important thing to keep in mind when making a temporary splice?

STEP IV

Have members of class make emergency splice without assistance. Inspect work.

1. Instruction Topic:	Splicing emergency wire.
2. Instruction Unit:	Making splice in emergency wire.
3. Limited to:	Splicing single strand of emergency wire.
4. Class:	6 inexperienced men.
5. Location:	In open or in class room.
6. Material:	Emergency wire cut in suitable lengths for each trainee, pocket knife, pair of pliers.
7. Estimated time:	30 minutes.

STEP I

Overhead questions:

1. Why is telephone communication necessary for fire control of the forest?

2. Are there occasions when these lines might be broken?

3. Do you know how many feet of wire are in one spool?

STEP II

Operations or Instruction Points	Plan for Instructions
1. Tie the square knot.	Demonstrate to the group the tieing of a square knot. This is done as follows: (a) Hold one wire in each hand, ends to the front, 10" of the wire extending through each hand. (b) Lay the end of right hand wire over the left. (c) Pass the end of the right hand wire under the left hand and inside of the loop. Pull through until it again points to the front.

Operations or Instruction Points	Plan for Instructions
	(d) Turn it back in the direction of and alongside the starting point over the original left hand wire. (e) Bring the latter up around the right hand wire, passing the free end down through loop. Pull tight. Instructor explains as he proceeds. Suggested question: "Do you know how a square knot looks when it is tied."
2. Scrape the wire.	Demonstrate scraping 2" of each end of wire. Explain: (a) How to scrape clean without cutting wire. (b) Can be done with pocket knife or side cut pliers. (c) Why clean wire for splice is necessary.
3. Twisting scraped ends.	Demonstrate twisting ends of wire. Explain fraying of strands and show how to put them back in place.
4. Making connection.	Demonstrate crossing scraped ends and wrapping firmly around opposite main line. Covering with tape. Explain necessity for a tight connection.

STEP III

Have members of the class make a splice. Supervise and give individual assistance as needed.

Questions for checking essential knowledge:

(a) Do you know why we tied the knot?

(b) What part of the splice forms the electrical connection?

(c) What part of the splice forms the mechanical connection?

STEP IV

Have members of class make emergency splice without assistance. Inspect work.

1. Instruction Topic:	Servicing and operation of "S" type radio transceiver, 1937.
2. Instruction Units:	(a) servicing. (b) operation.
3. Limited to:	(a) and (b) above.
4. Class:	Not more than 6 inexperienced men.
5. Location:	Field.
6. Material:	7 "S" type radio transceivers. 7 Sylvania 30 tubes. 7 Sylvania 49 tubes. 14 45 volt "B" batteries, Burgess #230P or equal. 7 7½ volt "C" batteries, Burgess #W5BP or equal. 7 "A" batteries, Burgess #2F2BP or equal. 7 Antennas. Black board, eraser, chalk. 7 screw drivers, small.
7. Estimated time:	3 hours.

Lesson 1 - Servicing.

STEP I

Introduction to the use, value, and reliability of radio communication on fires. Emphasize the time saved, etc.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Install batteries in box. "A" batteries) "B" batteries)	Demonstrate how batteries are placed in box. Explain that different companies manufacture batteries for the set and that these batteries are not always the same size, thus necessitating a different arrangement in battery container.

Operations or Instruction Points	Plan for Instructions
2. Hook-up "A" and "B" batteries.	Demonstrate how to hook-up the batteries to the set. Show the group the way set connections are marked. Explain that these connections must be attached to the batteries in a certain way or else the set would not operate; also danger of set if connections are not made correctly. Demonstrate how to use the battery circuit hook-up in connecting the batteries.
3. Install and hook-up "C" battery.	Demonstrate how to lift the set from box by means of taking out a few screws and lifting up gently. Point out the "C" battery container and how to install and connect battery. Explain that the "C" battery has a very long life and does not generally need replacing very often.
4. Install tubes.	Demonstrate how to install tubes. Show how it is possible to make sure a tube is not inserted in the wrong place. Further demonstrate how to lock the tube in place. Explain need for care in handling tubes when placing them in set or carrying them.
5. Tuning dial handle.	Demonstrate how to tighten this handle if it should become loosened; also, how to adjust it so the pointer gives a reading on the dial when the set is tuned in.

Operations or Instruction Points	Plan for Instructions
6. Antenna binding post.	Demonstrate how to tighten antenna binding post connection.
7. Strength batteries.	Demonstrate how to determine if batteries are weak or dead.
8. Tubes.	Demonstrate how to determine if a tube is burned out.

STEP III

Assign each member a radio. Have each one service the set as demonstrated above. Have each one explain how to determine if a battery is weak or dead, tube loose or burned. Assist or correct where necessary.

STEP IV

Same as above but without assistance.

Lesson 2 - Operation

STEP I

Brief bridge over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Brief explanation of limitations of set.	On the black board, demonstrate that the application of the "S" type radio transceiver is limited to communication between inter-visable points. Explain in simple language why; also that the distance limitations of set under usual operating conditions is about 15 miles.
2. Unpacking set.	Demonstrate how to do.

Operations or Instruction Points	Plan for Instructions
3. Naming parts.	Point out and name parts of set, i.e., receivers, binding post, tuning dial, rec-trans switch, transmitter, etc. Explain that it is very important to keep the transmitter away from metal face of set. If this is not done, set will be injured. Also, explain that immediate check should be made to see that the switch is in the "off" position, that the battery connections are checked.
4. Install antenna.	Demonstrate how to connect antenna to binding post, how to fasten other end to overhanging limb, etc. Explain that the antenna should be as nearly vertical as possible for best performance.
5. How to call.	Without turning on set, demonstrate how to call another station, i.e., Station S 123 on Mendenhall Hill calling S 124. Explain that it is necessary to make this call several times before saying "go ahead."
6. Talking.	Demonstrate how to talk into transmitter, also how to modulate voice for best transmission.
7. Making contact if dial reading is known.	Explain to group that if the dial reading of the station to be called is known, set dial at this reading and throw switch to transmitting position and call. Throw to receive and listen. If call is answered, proceed with message.

Operations or Instruction Points	Plan for Instructions
	Demonstrate above.
8. Making contact if dial reading is unknown.	Explain that if dial reading is unknown, throw switch over to transmitting position and whistle into trasnitter and slowly turn tuning dial back and forth across the scale. If the station being called is standing by, it will pick up signal. Demonstrate how this is done. Show after making the above demonstration how the other station is received by turning the tuning dial slowly back and forth across the scale with switch in receiver position to pick up signal of answering station. Explain that a steady hissing sound in receiver indicates that receiver is working properly; that as the dial reading of the other station is approached, this hissing becomes less and less, disappearing entirely when station is tuned in. Explain that tuning dial, tunes both transmitter and receiver and that when the other station is tuned in it will not be necessary to move the dial further for this location and station.
9. Operating several "S" stations simultaneously.	Explain how several sets may be operated simultaneously; the importance of this.

Operations or Instruction Points	Plan for Instructions
	Explain the seriousness of "rubbering" on another station with which the set does not have a schedule.
	Discuss schedules.

STEP III

Have each member of group go through the points given above and explain as the demonstration proceeds. Assist and correct where necessary. Practice until satisfied they know lesson.

STEP IV

Divide class into groups of two. Give each man in group a written fire message to be delivered to the other. Assign schedules. Assign radios. Have each report back in person and deliver the message sent by the other. Practice until satisfied they have learned how to operate "S" sets properly.

1. Instruction Topic:	"SPF"radio transceiver, 1937.
2. Instruction Units:	(a) installing antenna. (b) preparing set for operation. (c) receiving. (d) transmitting. (e) trouble shooting - receiver failure. (f) trouble shooting - transmitter failure.
3. Limited to:	Above instruction units.
4. Class:	6 inexperienced men.
5. Location:	Field.
6. Material:	2 "SPF" type radio transceivers, each with a fully equipped kit box and kit bag, supply of extra tubes.
7. Estimated time:	4 hours.

Lesson 1 - Installing antenna,"L" type.

STEP I

Give a brief introduction to the subject of radio and its use in connection with fire suppression.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Choosing location and space for antenna.	Demonstrate. Explain why it is important to have a clear span of at least 120 feet for antenna.
2. Location of radio set with respect to antenna.	Demonstrate. Explain that with the "L" type antenna the radio must be placed at one end of antenna.

Operations or Instruction Points	Plan for Instructions
3. Unwinding fish line.	Demonstrate how to unwind fish line from reel.
4. Tieing fish line to limb of tree.	Explain that the fish line should be fastened high enough in tree to permit this end, the far end of the antenna, to be 30 feet above ground if possible.
5. Unreeling antenna.	Demonstrate. Explain the purpose of the soldered nut on the antenna 15 feet from the end.
6. Attaching antenna to set.	Demonstrate how this is done. Explain that if the far end of the antenna is 30 feet above ground, the antenna can be run straight to the set; if the far end of the antenna is less than 30 feet above ground, the "L" type connection is necessary. Demonstrate the "L" type of antenna installation. Explain that in this type of installation the radio set should never be placed back under the main antenna lead. Explain purpose of insulators; need for keeping antenna free from ground green vegetation, brush, or any other object.

STEP III

Have each member of group go through installation of "L" type antenna. Assist and correct where necessary.

STEP IV

Unnecessary.

Lesson 2 - Preparing set for operation

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Check "OFF" - "ON" switch.	Point out switch and demonstrate how to check to make certain it is in the "OFF" position. Explain the importance of making certain the "ON"-"OFF" switch is in the "OFF" position.
2. Connect battery cable.	Point out battery cable and plug. Demonstrate how to insert battery plug in front of set.
3. RECV - TRANS switch.	Demonstrate how to push this switch in RECV position. Explain that the filament voltage for receiver is automatically compensated and does not indicate on the meter. Caution that the filament control is never turned for adjustment of receiver. This control is used for adjustment of transmitter. Tell group that receiver is now ready for operation.
4. Meter switch to TRANS-FIL position.	Demonstrate how to set the meter switch to TRANS-FIL position.
5. RECV - TRANS switch to TRANS position.	Demonstrate how to push to TRANS position.
6. Adjustment of FIL control.	Demonstrate with RECV-TRANS switch in TRANS position how to adjust FIL control until meter reads on red line.

Operations or Instruction Points	Plan for Instructions
	Explain that it is necessary to have RECV-TRANS switch in TRANS position for this adjustment. Also caution group that the RECV-TRANS switch should not be left longer than absolutely necessary in the TRANS position for this adjustment.
7. TRANS - TUNE position.	Demonstrate how to turn meter switch to TRANS-TUNE position.
8. Adjusting meter for lowest reading with set in TRANS-TUNE position.	Demonstrate how this adjustment is made. Explain that this adjustment should be made as carefully and accurately as possible. Also, that if set is working properly and the batteries are fresh, the minimum meter reading will be between 1.5 and 2.5. Expand this explanation by further adding that this particular adjustment is made only when the set is first set up, and that no further adjustment is made unless height of antenna is changed or the set is connected to a different antenna. Explain that tuning adjustment should be set for lowest reading, that if readings over 2.0 are permitted for only a few seconds, damage to tubes will result.
9. Switch operating position.	Explain that the set is always operated with the switch in the TRANS-FIL position. Turn switch to this position. Explain that the meter readings should be noted occasionally and FIL control should be adjusted to keep needle on red line.

Operations or Instruction Points	Plan for Instructions
	Explain that this is <u>important.</u>
10. Install batteries.	Demonstrate how to install batteries, both in connection with the portable kit bag and kit box. Explain the need for extreme care in hooking up batteries.

STEP III

Have each member of group of through the points taught in lesson and make such explanation as necessary as the demonstration proceeds. Assist and correct where necessary.

STEP IV

Same as Step III but without assistance.

Lesson 3 - Receiving.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Putting on earphones.	Demonstrate how to put on and adjust.
2. Throw switch to <u>RECV</u> position.	Demonstrate. Explain.
3. Turn <u>VOLUME</u> control to extreme clockwise position.	Demonstrate. Explain.
4. Turn BFO switch to <u>OFF</u> position.	Demonstrate. Explain. Explain the BFO switch is turned to "<u>ON</u>" position for reception of code signals and to "<u>OFF</u>"position for voice.
5. Finding voice signal.	Demonstrate.

Operations or Instruction Points	Plan for Instructions
	Explain that to locate voice signal, tuning dial is slowly turned over entire scale and when signal is picked up the dial is adjusted very slowly for best clarity.
6. Adjusting VOLUME control.	Demonstrate after voice signal has been adjusted for clarity, how to adjust VOLUME control for strength.
7. Loud speaker.	Demonstrate and explain its use. Caution against using loud speaker when signals are weak.

STEP III

Have group demonstrate how to bring in a voice signal, adjust for clarity and strength; also how to use loud speaker. Assist and correct where necessary.

STEP IV

Same as above but without assistance.

Lesson 4 - Transmitting.

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Listening to make sure no other station with same frequency is transmitting.	Explain why this is necessary.
2. Throw switch to TRANS position.	Demonstrate. Explain.
3. Making call.	Demonstrate. Explain.
	Explain procedure, i.e., station "SPF" 30 on Mt. Houghman calls "SPF" 4. Repeat this call several times. Finish calling - by saying "Go ahead."

Operations or Instruction Points	Plan for Instructions
	Explain further that the next step is to throw switch to receive position and try to pick up station "SPF" 4. If "SPF" 4 does not answer, try several times until successful or until satisfied "SPF" 4 is not on "stand by" or is having trouble. Explain that after contact is made, the call given can be much shorter. Caution to men to speak clearly and distinctly and talk directly into microphone, speak firmly but do not shout.

STEP III

Have group practice receiving and transmitting until they have learned the lesson. Assist and correct where necessary.

STEP IV

Give each man a written message. Have each one transmit his message to a previously set up station and to write down the reply.

Lesson 5 - Trouble shooting - Receiver failure.

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Receiver switch on, but receiver dead.	Explain that this may be due to any one of following reasons: (a) battery connections loose. (b) plug connecting battery cable to set may be loose. (c) head phone cord may be injured.

Operations or Instruction Points	Plan for Instructions
	(d) "A" or "B" batteries may be dead. (e) faulty switch contact. (f) burned out receiver tube. Demonstrate how to check for the above and repair where necessary.
2. Receiver alive but no signal.	Explain that this may be due to any one of the following causes: (a) antenna disconnected. (b) antenna in contact with front panel or other metal on set. (c) unusual receiving condition may be affecting reception. Demonstrate how to check for the above and how to correct is possible.

STEP III

By putting questions to group, determine if they have grasped the points in the lesson. Further discuss points as the need for additional instruction arises.

STEP IV

Simulate the conditions taught in Step II and call on member of the group to locate and correct the trouble.

Lesson 6 - Trouble shooting - Transmitting difficulties.

STEP I

Brief bridge over from previous lesson.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Transmitter working - signal weak.	Explain that this may be due to any one of the following causes;

Operations or Instruction Points	Plan for Instructions
	(a) battery connections loose, incorrectly connected. (b) plug connecting cable to set not connected or improperly connected. (c) "A" or "B" batteries weak. (d) antenna too near ground or touching green vegetation. (e) some unusual condition may be affecting transmission. Demonstrate how to check for and correct the trouble if possible.
2. Transmitter not functioning.	Explain that this may be due to the following causes: (a) tuning adjustment out of position. (b) burned out transmitter tube. (c) faulty switch contact. Demonstrate how to check for the above points and how to make repairs.

STEP III

By putting questions to group, determine if they have grasped the lesson. Expand on the instruction where necessary. Simulate conditions mentioned above and have members of the group actually go through the location and correction of trouble.

STEP IV

Give a written examination covering lessons.

FIRE SUPPRESSION

1. Instruction Topic:	Suppression of one man fire.
2. Instruction Unit:	How to suppress a one man fire.
3. Limited to:	How to suppress a one man fire.
4. Class:	8 - 10 men inexperienced, or having only a limited experience in fire suppression.
5. Location:	In field at selected site. Group assembled so that all can clearly see all parts of dummy fire problem.
6. Material:	Blackboard, chalk, lime or flour, fire tools, tank truck, back pack outfits filled with water, matches; also, one experienced guard.
Layout: for Step II -	Small dummy fire marked on ground.
Layout: for Step III-	Similar to layout for Step II but with varying conditions.
Layout: for Step IV -	Similar to layout for Step II or Step III but with a different set of conditions.
7. Time required:	4 hours - time of day, 1:00 P.M. until 5:00 P.M.

STEP I

Briefly relate personal experience on a one man fire to arouse interest.

Overhead questions:

(a) What do you suppose would happen if you were dispatched to a one man fire and did not know what action to take upon arrival?

(b) In all lines of work, isn't efficiency largely a result of advance knowledge on how to do the job well?

STEP II

Operations or Instruction Points	Plan for Instructions
1. Size up dummy fire. Considered factors in arriving at point of attack, i.e., hazards inside of fire, hazards outside fire, topography, wind direction, and velocity, possible rate of spread, fuel type, natural barriers, etc.	By conference bring out and list on the blackboard the salient points involved in handling the dummy fire portrayed on the ground, such as snags or logs near fire edge, snags inside steep slope, possibility of roll, etc. (Instructor's note: Do not determine point of attack).
2. Determine method of control.	By conference, after having determined all points to be considered before making initial attack, determine what method is to be used in stopping the fire, i.e., attack at head versus flanking attack, width of lines, character of lines such as trenching, etc.
3. Line location.	By conference, determine where line will be located, taking into consideration roll, nature barriers, etc.
4. Selection of tools.	By conference, bring out the best tool or tools to be used in constructing the line decided on, taking into consideration such items as cover, difficulty in digging, etc.
5. Suppression.	Demonstrate control of fire. Ignite the problem layout, permit it to burn to "lined" edge. Assign experienced guard to suppress it. Explanation: Point out and explain salient points in

the suppression job as experienced guard goes about the job of control.

Suggestive questioning:
By questioning the group during the period of control, the instructor determines if all members of the group have grasped the important points.

STEP III

Move to layout for Step III and after igniting the layout problem, assign an inexperienced guard to suppress the fire. With this guard will be an experienced man whose job it will be to assist and guide him when necessary as the job progresses.

Suggestive questioning similar to that under Step II will be forwarded to determine if all members of the group have grasped the points being studied.

STEP IV

Group moves to layout for Step IV. Layout is ignited. Assign an inexperienced guard to control fire. No assistance is given. Group take notes on progress of control job.

Following control, through guided conference, bring out the points in layout for Step IV and determine if all members of the group have grasped the essentials of the one man fire problem.

1. Instruction Topic:	Suppression of one crew fire.
2. Instruction Unit:	How to suppress one crew fire.
3. Limited to:	Preliminary size-up of fire, selection of tools, hot spotting, thorough size-up of fire, reorganization of crew, correct suppression technique, suppression of fire, mop-up.
4. Class:	10 to 12 men inexperienced.
5. Location:	Field.
6. Material:	Blackboard, chalk, lime or flour, fire tools, tank truck, backpack outfits, 6 experienced guards. Following layouts: Layout for Step I Layout for Step II Layout for Step IV
7. Time required:	4 hours.

STEP I

Briefly relate a personal experience on a small crew fire to arouse interest.

Overhead questions:

(a) If you were sent out to handle a small fire, would you know how to take charge of the situation, organize your men, and control the fire?

(b) Can each of you take charge of a small crew fire or properly function as a member of the crew on a small fire?

STEP II

Operations or Instruction Points	Plan for Instructions
1. Size-up of fire. Consider factors in arriving at point of attack.	By conference, bring out with the group and list on blackboard the salient points

Operations or Instruction Points	Plan for Instructions
	involved in handling the dummy fire, such as standing snag, bad stump, heavy brush, or reproduction close to but outside fire. Hazardous spots inside line, slope, wind direction, velocity, etc.
2. Determine method of control, select tools and organize crew.	By conference, have group determine proper control methods to employ and the tools to use; also the organization of crew.
3. Hot spotting.	By conference, have group recognize hot spots and necessity for attacking them first.
4. Thorough size-up and reorganization of crew.	By conference, bring out with group the necessity of a thorough resize-up of fire. Explain that this may show a need for reorganizing the work of the crew.
5. Suppression of fire.	By conference, bring out with the group the need for constructing a corral line first, followed by a control line, mop-up and patrol.
6. Correct method of attack, suppression, and mop-up of fire.	Have experienced crew, consisting of one crew leader and five guards, suppress the dummy fire which has been ignited, and allow to burn to marked outline of fire.
	With the trainees, walk around the fire. Explain the action of the crew leader and the accomplishments of the crew.
	By questioning the group, determine if all understand the points covered in this step, such as size of fire,

Operations or Instruction Points | PLan for Instructions

selection of tools, hot spotting, thorough size-up, corral line, control line, mop-up, etc.

STEP III

Set a fire with a similar layout and assign an inexperienced crew with an inexperienced crew leader to suppress it. An experienced crew leader will assist and guide the inexperienced crew leader, when necessary.

The inexperienced men not working on the fire will take notes of the good or bad practices observed on the fire, which will be discussed by all when the fire is controlled and mopped up.

STEP IV

Take group of trainees to another selected location with conditions differing somewhat from the first two. Set a fire and when it has reached the desired size, ask the second inexperienced crew leader and crew to suppress it without assistance or advice.

During the suppression of the fire, the men not working will take notes of the good or bad practices used, after which a general discussion will be held.

1. Instruction Topic:	One lick method.
2. Instruction Unit:	How to use the one lick method in line construction.
3. Limited to:	See (2) above.
4. Class:	9 men (2 sector boss caliber, 7 crew leader caliber).
5. Location:	Field.
6. Material:	49 men properly equipped for line construction in the type selected, 2 experienced foremen, 7 experienced crew leaders. Note: Men must be well trained in use of tools and safety practices; also in the one lock method of line construction. Second group, 49 men properly equipped for line construction in the cover type selected. These men are to be well trained in use of tools but should not be trained in the one lick method of line construction.
7. Estimated time:	8 hours.

STEP I (To trainees)

Brief introduction into the deplorably low rate of line production secured from line construction crews. Corrections necessary.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Distribution of tools.	Explain that the number of each type of tools for a crew of the size to be used will be the same as though the crews were working under the sector system; that this is because there is the same amount of

Operations or Instruction Points	Plan for Instructions
	brush to be cut, the same amount of duff to be removed, the same amount of line to be scraped. Explain further that the axe men are generally ahead, next duff removing tool men, scraping tool men, log buckers, snag fallers; also that back pack outfit men and some shovel men may be with the axe men to cool down hot spots, that snag fallers may be needed with advance crew to fell the most dangerous snags. Demonstrate the distribution of tools to the crew. Explain that the foremen are not equipped since it is their responsibility to see that the men are kept organized properly and that line is laid out ahead of crew, also that line is properly constructed, that crew leaders are not equipped with tools since it is their responsibility to keep their crews organized and functioning properly.
2. Organization of men.	Demonstrate and explain the organization of men, also the way in which the foremen and crew leaders are lined up with respect to the line construction job to be performed. Explain that generally one foreman is in advance of the crew laying out line, and supervising the advance section of construction crew, that one foreman is generally in the rear working with the rear section of the

Operations or Instruction Points	Plan for Instructions
	construction crew and supervising and inspecting line construction; that each crew leader works with his men, seeing that each man in the crew is properly performing his job and that his crew keeps moving progressively forward.
3. Line construction.	Demonstrate how line construction moves forward, explaining that the first or lead man merely works his way through the brush or other cover and does not make a completed line and, furthermore, that the line is not completed until the last man passes.
4. Distance between men.	Demonstrate the proper distance between men. Explain that the men should be kept as close together as safety will permit. This permits easier supervision of the men; also permits immediate changes in the amount of work any one man must accomplish on a certain length of line. Explain further that keeping the men working close together enables quick action in case the fire begins crowding a sector of the uncompleted line.
5. Constructing a section of line.	Demonstrate the construction of a definite sector of line. Explain to the group as the job moves forward, how corrections by the crew leaders and foremen are constantly being made, how

Operations or Instruction Points	Plan for Instructions
	Safety of men is cared for, how the work of one man is increased to compensate for construction through dense cover, how it is lightened when the line is being constructed through more open cover.
6. Signals.	Demonstrate how signals between front and rear foreman may be used to have each man accomplish a greater amount of work on a given sector of line, less work, etc.

STEP III

Have the trainees change places with the foremen and crew leaders and have them handle the line construction job using the one lick method.

Step III should be done in cover that will permit the instructor to move from place to place to assist and correct the trainees.

STEP IV

Have members of group take a crew of "green" men and construct a section of line using the one lick method. ("Green" as used here refers to crew unacquainted with one lick method but are well trained in the use of tools.

1. Instruction Topic:	Fire line construction.
2. Instruction Unit:	Fire line construction.
3. Limited to:	Choice of tools, width of line, disposal of litter, depth of line trenching, removal of logs from fire line, and cleaning around unfelled snags and trees.
4. Class:	5 inexperienced men.
5. Location:	Field; any type.
6. Material:	Proper assortment of tools for the cover type in which line construction is to be taught.
7. Time:	2 hours.

STEP I

Brief introduction to the subject of line construction.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Choice of tools.	Explain the importance of choosing the types of tools for line construction; that the choice of tools is largely determined by the type and density of cover, the character of the soil, digging, cutting, scraping, etc.
2. Width of fire line.	Demonstrate the width of line to be built in cover type at hand. Explain that the width of line in same cover type may vary with the slope, the humidity, wind, etc.
3. Disposal of litter.	Demonstrate where removed litter is placed. Emphasize that normally all litter

Operations or Instruction Points	Plan for Instructions
	is thrown on the side of the line away from the fire.
4. Depth of line.	Demonstrate by scraping away duff and litter what is meant by scraping to mineral soil. Explain and demonstrate the importance of cleaning line down to mineral soil, digging out roots that may carry fire across line, etc.
5. Trenching.	Demonstrate trenching and the reason for trenching. Explain why it is important to construct a trenched line on a steep side hill.
6. Removal of logs from fire line.	Demonstrate the importance of cutting logs out of fire line. Explain that if the logs were not cut they would cause the fire to cross the line and escape. Explain that no line is completed until all material, duff, litter, logs, etc. are removed from fire line.
7. Overhanging canopy.	Demonstrate what is meant by overhanging canopy and what action should be taken and the extent to which it should be removed.
8. Cleaning around unfelled snags and trees as part of the line construction job.	Demonstrate what is meant by clearing around unfelled snags and trees, and explain the importance of this clearing.

STEP III

Have each member construct a short section of line covering the points given above. Assist and correct as required.

STEP IV

Same as above but without correction. Follow with a group discussion of fire line construction.

1. Instruction Topic:	How to determine the area of a Class "B" fire.
2. Instruction Units:	(a) calculations. (b) pacing. (c) calculation of area of dummy fire.
3. Limited to:	(a), (b), and (c) above.
4. Class:	5 men, inexperienced.
5. Location:	Unit (a) in class room. Unit (b) in field. Unit (c) in field.
6. Material:	Blackboard, chalk, paper, one chain tape, red flags, 2 layouts of area to be measured.
7. Estimated time:	1 hour, 30 minutes.

Lesson 1 - Calculations.

STEP I Class Room

The instructor informs the class as to the use and importance of accurate acreage determination in the compilation of fire data.

STEP II Class Room

Operations or Instruction Points	Plan for Instructions
1. Units of measurement.	Explain to the class the units of measurement used in area determination, i.e. The acre Square chains Square feet. Write the units of measurements on the blackboard and have the class copy them in their notebooks, explaining that the figures should be retained for future field use.

Operations or Instruction Points	Plan for Instructions
2. Function of figures.	Explain and demonstrate, using the blackboard, how average widths and lengths of irregular areas are obtained. Irregular diagrams representing burned areas are drawn on blackboard and lines denoting directions and location of pacing are shown. Show how average width is obtained and how to secure length. These distances are converted into chains. Give them the formulae to be used in using these figures to secure area. The class writes down these simple formulae in their notebooks. Demonstrate how to use formulae.

STEP III

Through use of a blackboard diagram, outline a practical problem and have each member of the class calculate the area. Each trainee works out the area individually, with assistance when necessary.

STEP IV

Same as Step III but with trainee unassisted.

Group leaves for previously located layout for area determination.

Lesson 2 - Pacing.

STEP I Field

Upon group's arrival to problem layout, bridge over from class room to field by stating:"Now we will go ahead and use the information just learned to determine the area of this fire."

STEP II

Operations or Instruction Points	Plan for Instructions
1. Pacing.	Demonstrate with a 66' (1 chain) tape staked on the ground how to pace and how to keep track of paces, Explain how essential it is to use the natural stride.

STEP III

Have each member of the group pace the chain distance a sufficient number of times to determine the number of paces each normally takes to the chain. Check and assist as necessary.

STEP IV

Test of above.

Lesson 3 - Calculation of area of fire.

STEP I

Bridge over from pacing to actual measurement of area, impressing on the group how important pacing is in area determination.

STEP II

Operations of Instruction Points	Plan for Instructions
1. Securing average width; length.	Show group how to locate pacing lines to secure average width of area and where to pace to secure proper length.

STEP III

Have group pace average width and length of layout with what assistance is necessary. Calculate area by using formulae. Assist if necessary.

STEP IV

Have group go to new layout and, unassisted, determine area. Check answers to make sure measurements are correct.

LAW ENFORCEMENT

1. Instruction Topic:	Preserving tracks.
2. Instruction Unit:	Preserving tracks, making a cast of a track.
3. Limited to:	Preserving tracks, making a cast of a footprint with Plaster of Paris.
4. Class:	5 inexperienced men.
5. Location:	Field.
6. Material:	1 fly spray container, 1/2 quart size; large can of Plaster of Paris; clean water; splints of wood.
7. Estimated time:	1 hour.

STEP I

Brief introduction explaining the value of tracks as evidence.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Preserving tracks.	Demonstrate how tracks may be covered to preserve them until a cast can be made. Explain importance of exercising extreme care when going about this job; also, the reasons for protection of tracks, i.e., from wind, animals, insects, etc.
2. Sifting dry Plaster of Paris in a footprint.	Demonstrate how to sift Plaster of Paris in a footprint; show how much to sift before water is applied. Explain that this method of making a cast is the best since it lends itself to making casts of footprints in sand or dust.

Operations or Instruction Points	Plan for Instructions
3. Sprinkling with water.	Demonstrate how to use fly sprayer to spray water on Plaster of Paris. Explain how much water should be applied, the need for care in this first application of water; also, that care exercised during the initial stages of building up the cast will largely determine whether or not the cast is a true replica of the footprint.
4. Building up cast.	Demonstrate how the cast is built up through successive stages of applying Plaster of Paris and water.
5. Reinforcing cast.	Demonstrate how to reinforce cast with small slivers of wood after it has been built up to 1/2 inch in thickness.
6. Completing cast.	Demonstrate completion of cast, following reinforcing with slivers of wood. Explain that the extreme care exercised in the first part of the cast preparation is not as important now since the impressions have been made and all that is necessary now is to build the cast up to sufficient strength for handling. Inform the group that one inch in thickness will give the required strength. Explain further the time necessary for the cast to set.

Operations or Instruction Points	Plan for Instructions
7. Lifting cast.	Demonstrate how to lift the cast from the footprint; also how to wash and clean cast.

STEP III

Have each member of group construct a cast of a footprint. Assist and correct where necessary.

STEP IV

Have each member of the group construct a cast of a footprint, explaining meanwhile the reasons for the several operations involved as he carries forward the cast making job.

1. Instruction Topic:	How to read the Forest Service base map.
2. Instruction Units:	(a) principal meridian-base lines. (b) township, ranges. (c) subdivision of townships into sections. (d) subdivision and legal description of the section. (e) fractional townships and sections. (f) the map legend. (g) the contour.
3. Limited to:	How to read and recognize land lines, topographic features, land subdivisions, legends on the Forest Service base and topographic maps.
4. Class:	Preferably a class of six, but can be given to a larger group if some one familiar with map reading is available to assist and check each group of 6 inexperienced men.
5. Location:	Class room.
6. Material:	Blackboard, writing material, diagrams prepared to cover points in various lessons, topographic and base maps.
7. Estimated time:	3 hours.

Lesson 1 - Principal meridians and base lines.

STEP I

Brief introduction to whole subject.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Starting points.	Explain through diagram where starting points are

MISCELLANEOUS

Operations or Instruction Points	Plan for Instructions
	located, the names of these starting points, why they were selected, and the importance of remembering them.
2. How and where meridians and base lines were laid out.	Explain through diagram how and where base lines were laid out. Show how extension of these lines from one starting point will not join up with lines projected from another starting point. Point out to the group that this factor is important, the reason to come later in lesson.

STEP III

Through questioning, determine if the group has grasped the important points brought out in Lesson 1. If not, repeat Lesson 1.

STEP IV

Unnecessary.

Lesson 2 - Township, range lines.

STEP I

Brief carry over from Lesson 1.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How laid out.	Illustrate and explain through blackboard diagram how townships are laid out from the starting point of the meridian and base lines.
2. Townships, township lines.	Illustrate and explain through blackboard diagrams the size and shape of a normal township. Discuss township lines.

Operations or Instruction Points	Plan for Instructions
3. Range lines.	Illustrate and explain what is meant by range lines, how they are used in locating townships.
4. Numbering townships.	Illustrate and explain how townships are numbered north to south, south to north of starting point, also east to west and west to east of starting point. Emphasize importance of this numbering.
5. Legal description of townships.	Illustrate and explain legal description of townships.

STEP III

Question the class on the points brought out in lesson. If need for further instruction is found necessary, repeat that portion of lesson which will import the needed information.

STEP IV

Give a written test on locating townships when description is given; also have group give description of township when (x) marks it on a prepared map.

Lesson 3 - Subdivision of townships into sections.

STEP I

Brief carry over from Lessons 1 and 2.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Dividing normal township.	Illustrate and explain division of township into sections.
2. Number of sections in normal township.	Have group count the sections in the township.

Operations or Instruction Points	Plan for Instructions
3. Area of sections.	Through questioning, have group arrive at the area of the standard section - dimensions.
4. Description of section.	Show how a section is described and the importance of the description; tie back to township description.

STEP III

With a township layout, have some member of the group come to the blackboard and divide into sections. Question the group as the township is divided into sections to determine if he is doing the job correctly. Have another member of the group number the sections. Question the group to make sure the numbering is progressing correctly. Question the class on the area of a section; also on legal description of a selected section.

STEP IV

With a township plot for each member of the class, have each one divide into sections and number them; also give legal description when meridian, township, and range is given.

Lesson 4 - Subdivision of a section

STEP I

Brief bridge over from Lessons 1, 2, and 3.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Quarter section.	Illustrate how a section is divided into quarter sections.
2. Describing quarter section.	Explain to group how a quarter section is described.
3. Area of quarter section.	Question and receive from group area of quarter section.

Operations or Instruction Points	Plan for Instructions
4. Forty.	Illustrate how the quarter section is divided into forties.
5. Description of "40."	Explain and inform group how a forty is described.
6. Area of forty.	Question and receive from group area of forty.
7. Division of forty.	Illustrate to group how forty is divided and description of subsequent division.
8. Legal description of forty.	Explain to group how a description of forty is written, tieing it back to meridian; i.e., Twp. 6 S, R. 6 W., NE NW Section 16, M.D.M. Show how this description will locate the forty on forest map.

STEP III

Have members come before the group, individually, and show how to divide a section into quarter sections, forties, describe each forty with reference to section, township, and meridian.

STEP IV

Assign each member of the class a blank piece of paper and have each one locate a starting point layout for a given meridian and base line, layout and describe 3 townships, divide one township into sections and number each section, divide one section into quarters, one quarter into forties, and give a complete legal description of one forty.

Lesson 5 - Fractional township and sections.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Where fraction townships occur.	Illustrate and explain on blackboard the joining of two meridian - base areas.
2. Why fractional townships occur.	Expand the above illustration and show why fractional townships result from joining above areas.
3. What part is missing.	Illustrate and explain what part of township is missing and show section of fractional townships are numbered.

STEP III

Question group to determine if they have grasped the idea.

STEP IV

Give each member of the group a fractional township plat laid off into sections. Have each number sections.

Lesson 6 - The legend.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. What is meant by the legend.	Explain to group what is meant by map legend.
2. Use of legend in reading maps.	Illustrate the use of the legend in map reading.

STEP III

Have group practice on using the legend to read maps. Assist and correct where necessary.

STEP IV

Test their knowledge in use of legend in map reading.

Lesson 7 - The contour.

STEP I

Brief bridge over from previous lessons.

STEP II

Operations or Instruction Points	Plan for Instructions
1. What is a contour.	Explain that a contour is an imaginary line of equal elevation on the earth's surface. Illustrate and explain why a water level line is in effect a contour. Explain further that a water rise of 10 feet will form another contour of a different shape if there are irregularities such as draws, etc. at the lake's edge.
2. What are contour intervals.	Demonstrate by mass diagrams that a contour interval is the vertical distance between two contours.
3. How are contours numbered.	Illustrate and explain how contours are numbered. Explain how these numbers can be used to determine approximate elevation of points on ground by referring to the contour map.
4. How to pick out and recognize physical features on the maps by reading contours.	Illustrate and explain on blackboard how contour lines form a mountain, denote a lake, a draw, canyon, etc. With contour maps, show how mountains can be picked out; canyons, saddles, ridges, and

Operations or Instruction Points	Plan for Instructions
	other physical features recognized. Bring out steepness of slope by reference to contour lines on map.

STEP III

Each member having a contour map, have him pick out a mountain, give its elevation; a ridge top, a canyon, a saddle, a draw, etc. Assist and correct where necessary.

STEP IV

Give a complete examination covering all points taught in map reading lessons.

1. Instruction Topic:	The diary.
2. Instruction Unit:	How to write a diary.
3. Limited to:	The essential points to be considered in writing a diary.
4. Class:	10 men.
5. Location:	Class room.
6. Material:	Diary notebook per man - blackboard, chalk, eraser, prepared diary.
7. Estimated time:	1 hour.

STEP I

Brief introduction discussing use of diary, need for accuracy, purpose.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Points to be considered in writing a diary.	Post on the blackboard a large sized sheet of a prepared diary. By guided conference, analyze the sample diary to bring out the points that must be considered in writing a diary. 1 - date. 2 - starting place. 3 - time of beginning work. 4 - where to, and how travel was performed. 5 - did what, with, or for whom. 6 - incidents. 7- distance travelled by automobile, mileage readings.

Operations or Instruction Points	Plan for Instructions
2. Writing the diary.	Relate to the group a full day's work recently experienced. Demonstrate writing a diary of this day's work on the blackboard. Through guided conference, have group identify the elements or proints covered in the written record of the day's work.

STEP III

Relate to the group a recent day's work. Have each write a complete diary covering what was related. Have each man read diary with group, suggesting betterment.

STEP IV

Same as above but without assistance. Check to determine if done correctly.

1. Instruction Topic:	Four Step Method.
2. Instruction Unit:	Teaching instructors the use of the Four Step Method of instruction.
3. Limited to:	Teaching the Four Step Method by use of the Four Step Method.
4. Class:	5 instructors inexperienced in the use and application of the Four Step Method.
5. Location:	Field.
6. Material:	1 shovel L. H. R. P., 1 axe D.B., 1 axe S.B., 1 Pulaski, brush hook, blackboard and chalk; lesson plans for inspection of shovel, axe, Pulaski, brush hook.
7. Estimated time:	2 hours.

STEP I

Brief introduction into subject to arouse the attention, curiosity, interest, and desire of the group.

STEP II

Note: To teach how the Four Step Method of instruction is used, carry the teaching process from Step I through Step IV using "The inspection of a L.H.R.P. shovel" as a lesson.

Operations or Instruction Points	Plan for Instructions
1. Step I - Four Step Method	Demonstrate.
2. Step II - Four Step Method	Demonstrate.
3. Step III - Four Step Method	Demonstrate.
4. Step IV - Four Step Method	Demonstrate.

STEP III

By suggestive questioning and guided conference, have the group recall what took place in the demonstration lesson from beginning to end. List all points on blackboard and through guided conference, evaluate and segregate these points into Step I, Step II, Step III, and Step IV of the lesson taught under Step II of this lesson plan.

With these points segregated and listed on the blackboard, have a member of the group demonstrate teaching a lesson in the inspection of the shovel. Correct and assist where necessary. Question group to make certain fundamentals of the Four Step Method of instruction have been grasped.

STEP IV

Give a member of the group a prepared lesson plan on the inspection of the axe. Have him study it carefully for a few minutes and then have him demonstrate how to teach the inspection of the axe, using the Four Step Method of instruction. Repeat similar lesson plan with other members of the group.

1. Instruction Topic:	Panoramic pictures.
2. Instruction Unit:	How to use panoramic pictures.
3. Limited to:	Teaching how to use panoramic pictures.
4. Class:	8 inexperienced men.
5. Location:	Lookout, preferably.
6. Material:	Several sets of panoramic pictures, graduated scales to go with above sets, blackboard, fire finder.
7. Estimated time:	30 minutes.

STEP I

Briefly explain value of panoramic pictures in fire work.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Matching 3 pictures, full panorama to make circle.	Demonstrate: (a) by means of set of unbacked pictures show how they form a complete circle of area visible to lookout. (b) flatten pictures out in normal position for use. (c) by diagram and referring to fire finder, show how pictures are divided into an azimuth circle of 360°. (d) show position of each picture in circle. (e) demonstrate matching of pictures by degrees and land marks.

Operations or Instruction Points	Plan for Instructions
2. Horizontal line.	Demonstrate and explain how horizontal line was laid out on picture and what it means.
3. Vertical scale.	Demonstrate and explain use of vertical scale and what it means. Tie this instruction into vertical scale on fire finder. Show how to read vertical scale.
4. Horizontal scale.	Demonstrate and explain what the horizontal scale is and how it is related to the azimuth readings of the fire finder. Show how to read vertical scale.
5. Locating point on panoramic pictures.	Assuming a vertical reading and horizontal reading, demonstrate and explain how to use these figures to locate a point on pictures.
6. Securing vertical and horizontal reading from point on pictures.	Demonstrate and explain how this is done.

STEP III

Secure readings through use of the fire finder on some prominent point. Have the class transfer this reading to panoramic picture and locate point. Select a point on pictures and secure readings. Have some member of group orient the fire finder on this point using the readings given. Assist trainees where necessary.

STEP IV

Same as Step III but the trainee should explain the principles involved and reasons for the several operations, etc.

1. Instruction Topic:	Learning country, maps, features shown on panoramic pictures.
2. Instruction Unit:	How to learn country, maps, features on panoramic pictures.
3. Limited to:	How to learn country without leaving lookout station.
4. Class:	5 men who do not know or only have slight knowledge of country from lookout station.
5. Location:	Field - lookout station.
6. Material:	Lookout station equipped with Osborne fire finder, maps, 5 binoculars, 5 magnifying glasses, 5 sets of panoramic pictures with prominent points named.
7. Estimated time:	1 hour, 30 minutes.

STEP I

Brief introduction to subject, explaining importance of knowing country.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Use of panoramic pictures.	Select a prominent point on panoramic picture. Demonstrate how to secure vertical and azimuth angle of point.
2. Use of fire finder.	Set readings of vertical and azimuth angles on fire finder. Demonstrate by looking through the sights of the fire finder that the point on the panoramic picture can be selected on terrain.
3. Use of maps.	Demonstrate by following out the line of sight on

Operations or Instruction Points	Plan for Instructions
	map how point on map can be determined. Explain that in the event the point cannot be readily determined on map, to make the selection by process of elimination, i.e., present beyond that river - that creek across the valley, etc. After point on map has been selected, determine name from map. Explain that if point is not named on map, that to identify it, i.e., point 2 miles north Dome Hill, point above forks of Sheep Creek. Note: If the prominent point is named on panoramic picture, selection of point on map is simple, merely following out line of sight until point with same name is shown.
4. Distance point from lookout.	Demonstrate how to determine the air line distance from the lookout to the point.
5. Permanent recording of point.	Demonstrate how a simple tabular form may be drawn up to record the vertical angle, azimuth angle, distance, and name of point. Explain that this record is important since through it points can quickly be identified, the map location of which is once known.

STEP III

Have each member of the class make selection of prominent features on panoramic pictures,

secure the correct angle readings, transfer them to the fire finder, and determine location of the selected feature on map. Assist and correct where necessary.

STEP IV

Same as above without assistance.

LESSON PLANS

INVOLVING CONFERENCE METHOD OF INSTRUCTION.

1. Discussion Topic:	The Camp Boss' job.
2. Objective of discussion:	To determine the duties of a Camp Boss.
3. Method of instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as Camp Boss.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Camp Boss' job

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Camp Boss to accomplish.

This list should include the following type jobs:

1. Plans the detailed arrangement of and sets up the fire camp in the previously agreed upon location.

2. Organizes the staff setup necessary to handle the various jobs in connection with camp operation.

3. Establishes communication with dispatcher and fire line. (Turns this job over to the Communication Chief if the fire is large enough to need such a position).

4. Determines when the first meal is needed and the number of men to be fed.

5. Furnishes this information to Mess Officer and checks to make sure that the meal is being prepared.

6. Initiates an inventory of all supplies and equipment in camp.

7. Designates sleeping areas and makes assignments.

8. Sees that warming fires are provided when needed.

9. Sees that men are fed, equipped, checked, and in readiness for line duty as required.

10. Supervises reconditioning of tools brought in off lines.

11. When camp is evacuated, sees that all necessary records are brought up-to-date and filed for future reference.

12. Breaks camp and sees that it is properly cleaned up.

13. Sees that all tools and equipment are returned to proper destinations.

14. In the event the size of the fire does not warrant such aides as Timekeeper, Supply Officer, etc., the Camp Boss will assume such duties. On the larger fires he supervises his staff and checks their performance with particular attention to the following:

Camp Communication Officer

a. Are communication channels functioning, messages being written and brought to the attention of right persons?

Camp Supply Officer

a. Is adequate supply of food, tools, equipment, commissary, and other supplies being maintained?

b. Is there prompt recording of all receipts and issue of such supplies?

Mess Officer (When in Forest Service operated camp)

a. Are balanced rations on hand in sufficient quantities?

b. Are menus written, meals served, and lunches prepared as needed?

c. Is sanitation being cared for?

d. Is kitchen personnel on shift basis?

e. Are all men and overhead kept out of kitchen except kitchen personnel on duty?

Maps and Records Clerk

a. Are maps and records being maintained currently?

Truck Master

a. Have loading and parking zones been established and are they being adhered to?

b. Do drivers remain with trucks until relieved?

c. Are trucks maintained and serviced?

d. Is dispatching system functioning and records of truck movements currently maintained?

Tool Tender

a. Is all equipment checked and recorded as received and issued?

b. Is tool supply in designated place and kept in an orderly and neat manner?

c. Is reconditioning of all equipment done promptly and by experienced men?

Timekeeper

a. Are records being kept in accordance with standard instructions to timekeepers where hired fire fighters are involved?

b. Are accurate records of CCC men on fire being maintained?

Chief Packer

a. Are loading and feeding zones established and being adhered to?

b. Are forage and supplies adequate and necessary record maintained.

c. Are shifts for packers and stock arranged?

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Camp Boss in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Camp Boss' job.

1. Discussion Topic:	The Crew Boss' job.
2. Objective of discussion:	To determine the duties of a Crew Boss.
3. Method of instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as Crew Boss.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Crew Boss' job

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Crew Boss to accomplish.

This list should include the following type jobs:

1. Sees that men get up promptly and go through mess line and eat as a unit.

2. Lists each member of his crew by name.

3. Inspects members of crew for clothing, shoes, etc., and if unsatisfactory, reports condition to Sector Boss.

4. Secures list of tools and other equipment needed and assigns to crew. Checks to determine if or kinds required and in proper shape.

5. Checks that water and lunches are available and that provision for future supply is made.

6. Learns definitely what transportation is provided for the crew.

7. Checks men through Timekeeper, and on to trucks or other transportation.

8. Makes final check of men and equipment before leaving camp.

9. Secures from Sector Boss details of his job and of his line assignment, best route of travel thereto, and the time objectives.

10. Assigns definite jobs to each crew member as required to get planned job done, and sees that they do these properly, train them as need arises.

11. Remains on line assigned to his crew and works with them at all times.

12. Ties in work of crew with that of adjacent crews.

13. Pays special attention to and provides for safety of crew and renders first aid if needed.

14. Watches specially for dangerous conditions, such as spot fires, flare-ups, etc.

15. Keeps Sector Boss informed as to additional needs for men and equipment.

16. Remains on line until relieved.

17. Checks men, tools and equipment against personnel and also lists and returns them to camp as units.

18. Checks in tools and equipment, accounting for shortages.

19. Checks in the crew through Timekeeper.

20. Takes crew as unit through clean up and mess.

21. Inspects crew members for health, clothing, etc. and reports conditions needing correction.

22. Ascertains rest area - when instructed takes crew and obtains bedding.

23. Sees that crew sleeps in same general place.

24. Keeps men from milling around in camp.

25. Obtains from Sector Boss the time crew is to be awakened, fed, and dispatched from camp for line.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Crew Boss in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Crew Boss' job.

1. Discussion Topic:	The Communication Chief's job.
2. Objective of discussion.	To determine the duties of a Communication Chief.
3. Method of instruction:	Guided conference.
4. Class:	8-20 men who have had some experience as Communication Chief.
5. Location:	Class Room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Communication Chief's job.

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Communication Chief to accomplish.

This list should include the following type jobs:

1. Develops adequate communication system to camps and on fire lines.

2. Obtains prompt delivery on fire of necessary communication instruments and construction supplies, and supervises their installation.

3. Secures operators for established stations where needed, instructs them in duties, furnishes call card and supplies, and supervises operation.

4. Sets up a radio schedule (furnishing copy to all operators) to reduce interference to a minimum.

5. Maintains adequate supplies for prompt repair and maintenance of all communication facilities.

6. After installation is completed, inspects performance of communication system currently. Remedies deficiencies.

7. Puts in standard system for recording and filing messages received or transmitted from written copy.

8. Maintains map record of stations and lines.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Communication Chief in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Communication Chief's job.

1. Discussion Topic:	The Division Boss' job.
2. Objective of discussion:	To determine the duties of a Division Boss.
3. Method of instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as Division Boss.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Division Boss' job

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned the Division Boss to accomplish.

This list should include the following type jobs:

1. Obtains and checks to be sure he understands the written instructions from Fire or Zone Boss on:

   a. General plan of action for Division and correlation with adjoining Divisions.

   b. Location and boundary of Division.

   c. Camp locations planned.

2. Secures from Fire or Zone Boss for his Division:

a. Names and qualifications of overhead available by shifts.

b. Man power on job by shifts and that order to come in.

c. Special equipment available.

d. Transportation on hand to move men and horses for riding or packing if needed; best routes of travel.

e. Best map available.

f. Weather reports currently, and transmits these to Sector Bosses.

3. Discusses and outlines work planned on each definitely designated Sector with Boss to whom each is assigned. Confirms instructions in writing.

4. Checks on communication needed to facilitate work in Division and places orders for required installations.

5. Anticipates need for special equipment and additional man power, etc., and places orders in time that they will be available when required.

6. Inspects in detail, progress and quality of work on his Division at least twice each shift and applies corrective action promptly when needed.

7. Studies fire behavior and recommends to Fire or Zone Boss changes in plan of action to meet changed conditions.

8. Keeps Fire or Zone Boss informed currently in detail of developments on Division.

9. Keeps in touch with adjacent Division Bosses to unify work program.

10. Sees that Sector Bosses turn in information to Camp Boss needed to keep up Fire Progress map and Organization chart.

11. Discusses Division plans for each shift with Camp Boss and secures his cooperation in meeting them. When operating out of a fire camp other than a Zone fire camp or Fire Headquarters, the Division Boss will be the Senior Officer in charge of all line and camp activities.

12. Turns over full information on developments and plans to his relief Division Boss for the period he is to be on duty.

13. Sits as a member of Fire Bosses' Board of Strategy equipped with Division map, data, and proposed plan for next shift.

14. Collects from his Sector Bosses and turns in maps and data for use in posting Progress Map and Chart.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Division Boss in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Division Boss' job.

1. Discussion Topic:	The Line Inspector's job.
2. Objective of discussion:	To determine the duties of a Line Inspector.
3. Method of Instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as Line Inspector.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Line Inspector's job.

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Line Inspector to accomplish.

This list should include the following type jobs:

He inspects performance and checks:

1. Whether best methods of fire fighting being used.

2. On adequacy of tools available on line.

3. Adequacy of man-power for the job. Redistribute man-power where needed.

4. On correlation of line units.

5. To ascertain if proper standards are being followed in line location, line construction, mop-up, patrol, and if proper rates of production are being maintained. Checks as to whether workers are being trained currently as needed.

6. Adequacy and capability of overhead of all kinds.

7. To determine if line output is maximum possible under existing conditions.

8. To find out if job as a whole progressing satisfactorily.

9. To see if lines are located in advance.

10. Adequacy of water supply.

11. On possibility of using machinery.

12. To see that proper communication is established and maintained.

13. To find out if sector and line bosses are keeping required records.

In addition to the foregoing duties, the Line Inspector notes possible secondary lines of defense, makes full report of inspection to the Division Boss, and handles other jobs such as land or air scouting, as assigned.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Line Inspector in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Line Inspector's job.

1. Discussion Topic:	The Scout's job.
2. Objective of discussion:	To determine the duties of a Scout.
3. Method of instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as a Scout.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Scout's job.

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Scout to accomplish.

This list should include the following type jobs:

1. Does general scouting and mapping of fire perimeter or section of fire perimeter.

2. Scouts ahead of control crews, determining, mapping, and reporting location and progress of fire, the type of cover and terrain, possible location for control lines, and probable changes in fire behavior.

3. Locates water in vicinity of possible control lines, and new camp sites.

4. Selects possible camp sites.

5. Selects possible means of access to fire edge and marks route of travel with suitable signs.

6. When necessary, acts as guide to suppression forces between fire camp and fire edge.

7. Keeps superior officer advised of status of control.

8. Makes recommendations as to man power, tools and equipment necessary to accomplish control job on his section of fire.

9. If required, will mark location of control lines in advance of control forces.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc., of each job assigned to the Scout in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Scout's job.

1. Discussion Topic:	The Sector Boss' job.
2. Objective of discussion:	To determine the duties of a Sector Boss.
3. Method of instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as Sector Boss.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Sector Boss' job.

Phase I - Conference

Using the various devices recommended for conference leaders, assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Sector Boss to accomplish.

This list should include the following type jobs:

1. Obtains and studies written instructions from Division Boss as to location and boundary of sector, best routes of travel, and detailed plans of action to attain control objectives.

2. Keeps list, by shifts, of crew bosses and number of men available for each, adjusting numbers in crews to meet needs.

3. Sees that crew bosses check their men through Timekeeper, and that they obtain the proper number and types of tools.

4. Assigns specific jobs on definitely described portions of line to each crew boss.

5. Covers in detail and checks progress and quality of work on his entire sector at least four times each shift.

6. Stimulates crew bosses, and where satisfactory accomplishment is not taking place, takes immediate corrective action.

7. Trains crew bosses in their jobs and in training crew personnel. Sees that crew bosses give adequate training to crew personnel.

8. Contacts adjoining sector bosses and correlates his work with theirs.

9. When conditions change, making it impossible or impracticable to carry out detailed plans previously agreed upon, notifies the Division Boss at once and agrees with him on new action. In case of a sudden emergency requiring immediate action, he uses his own judgment, reporting action taken to Division Boss as promptly as practicable.

10. Turns in record of accomplishments, i.e., lines built, back fired and mopped-up, to Division Boss for entering on progress record.

11. Remains on sector until relieved.

12. Acquaints relief Sector Boss with all conditions pertaining to sector.

13. Checks to determine that all his crews have been relieved and that the Crew Bosses have checked all men and equipment before leaving line.

14. In fire camp, checks to see if Crew Bosses have checked in their men and tools, and have provided for their welfare.

15. Finds out where his Crew Bosses are sleeping while off shift in order to be able to mobilize men in a hurry if required.

16. Obtains from Division Boss the time crews are to be awakened, fed, and dispatched from camp, and advises Crew Bosses to take appropriate action.

Phase IV - Conference

Through discussion, the group will determine the scope,

character, etc. of each job assigned to the Sector Boss in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Sector Boss' job.

1. Discussion topic:	The Supply Chief's job.
2. Objective of discussion:	To determine the duties of a Supply Chief's job.
3. Method of instruction:	Guided conference.
4. Class:	8 - 20 men who have had some experience as Supply Chief.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Supply Chief's job.

Phase I - Conference

Using the various devices recommended for conference, leaders assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion, select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Supply Chief to accomplish.

This list should include the following type jobs:

1. Anticipates needs of all fire camps and prepares plans for service of supply.

2. Makes all prearrangements for prompt ordering, delivery, and distribution of supplies and equipment.

3. Collects and correlates orders from all fire camps for tools, commissary supplies, and equipment. Fills orders to extent possible from stocks on hand, ordering additional when necessary through proper channels.

4. Sees that Camp Bosses anticipate needs for tools and equipment and submit orders promptly; maintains adequate stock to meet needs; knows where surpluses are available for possible transfer.

5. Sees that Camp Bosses anticipate needs and place orders for subsistence supplies (where Forest Service runs mess) before 3:00 P.M. Determines if quantity and quality are being maintained.

6. When necessary to purchase supplies locally, secures approval of Chief of Staff, and procures in conformance with established procedure.

7. Maintains current inventory record of all tools and equipment, showing their location.

8. Sees that invoices are checked and record maintained of incoming subsistence and other supplies and their distribution.

9. Maintains other records as required.

10. Secures clerical help as needed from Chief of Staff.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Supply Chief in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Supply Chief's job.

1. Discussion Topic:	The Transportation Chief's job.
2. Objective of discussion:	To determine the duties of a Transportation Chief.
3. Method of instruction:	Guided conference.
4. Class:	8 -20 men who have had some experience as Transportation Chief.
5. Location:	Class room.
6. Material:	Blackboard, chalk, eraser.
7. Estimated time:	2 hours.

Discussion topic: The Transportation Chief's job.

Phase I - Conference

Using the various devices recommended for conference leaders, assemble ideas, facts, or experiences that have a bearing on the topic as brought out in the group discussion.

Phase II - Conference

Through group discussion select the facts or experiences that bear directly on the topic, eliminating all irrelevant material.

Phase III - Conference

Through discussion and decision by the group, evaluate the functioning facts or experiences found pertinent to the job in Phase II above. This evaluation by the group should result in a list of jobs being assigned to the Transportation Chief to accomplish.

This list should include the following type jobs:

1. Obtains transportation needs for all fire camps. Makes plans and prearrangements for securing same.

2. Collects requisitions for transportation facilities and supplies (gas, oil, parts, grease, forage, etc.); makes adjustments between camps where possible; order through proper channels when necessary.

3. Decides disposition of equipment requiring major repairs; makes arrangements for replacements where necessary.

4. Obtains special equipment such as tank trucks, trail builders, tractors, graders, pack and saddle stock when required by Chief of Staff.

5. Provides for inspection of mechanical condition of automotive equipment and for minor adjustments and repairs; inspects for proper functioning of all transportation personnel and equipment; inspects for compliance with safety requirements; inspects condition of animals and equipment, and forage supply; maintains written record and file of inspection.

6. Maintains record of location of each piece of equipment and various items of supplies; records of use; records of gas and oil consumption; records use of rented trucks and animals, to be turned in to Chief of Staff.

7. Sees that routes of travel used are posted with direction signs.

8. Sees that routes of travel are kept open and passable, or rerouting set up if conditions require.

9. Establishes traffic controls where needed to prevent congestion or accidents.

Phase IV - Conference

Through discussion, the group will determine the scope, character, etc. of each job assigned to the Transportation Chief in Phase III above. The conference leader will clarify, amplify, and otherwise assist the group to arrive at a thorough understanding of the Transportation Chief's job.

TRAINING

IN

FIRE DANGER RATING

1. General Instructions.

2. Outline of Subjects.

3. Individual Lesson Plans.

By V. C. De Lapp,
Chief Fire Dispatcher,
Angeles National Forest.

May 1, 1939.

INSTRUCTIONS.

In approaching the training of personnel in Fire Danger Rating, try above everything else to convey the idea that Fire Danger Rating is comparatively simple to use and is not a system that is being gagged down the throats of administrators. Also in instructing the Fire Danger Rating, try to use understandable terms without, of course, cheapening the instructing.

Another point that should be expressed is that Fire Danger Rating is not necessarily something new, with the exception of the Fuel Moisture Sticks. Bring out the fact that we have all talked about humidity, wind velocity, rate of spread, etc. and the other factors that go to make up the Fire Danger Rating System, as a means of help. Explain that Fire Danger Rating is merely a systematic organizing and application of these factors.

If these thoughts are woven into the training all the way through, the subject can be put over more easily than if it is handed out to the personnel as some new idea conceived by researchers.

Attached is an outline upon which the lesson plans have been predicated and the first page of this outline is used as an introduction. This introduction usually takes from 1/2 hour to an hour. Instructors should have no more than six trainees and they should be gathered around a blackboard or something else that can be used in lieu of a blackboard and on the wall should be a map of the Fire Danger Rating areas, showing the stations for the entire Forest.

As the trainees come in and sit down, the instructor should check his program to see that all trainees are present. He can then remark that he notices that they are there to take training in Fire Danger Rating, or words to that effect. This then gives him an opening. He should write

on the blackboard, in large letters, "FIRE DANGER RATING SYSTEM". He can then throw in a few words to the effect that probably the trainees have heard about this system and that before they leave his classes they will be able to make an observation and understand as much as they should about the system. He should then ask the trainees if they know anything about Fire Danger Rating and put up on the blackboard their answers, in a few words.

After the instructor feels that he has received enough answers to break the ice with the trainees, he should go back and cross out the answers that do not apply. Then he should take the remaining answers, together with his own previously prepared definition and write on the blackboard an understandable definition of Fire Danger Rating and its main objectives.

In the meantime trainees have probably been looking at the Fire Danger Rating Map on the wall, so the instructor can make some such remarks, "You probably wonder what sort of map it is and what the symbols mean". He then goes over to the map with the pointer to point out boundary lines, Fire Danger Rating areas, and explains what the symbols mean. At this point he can then explain how, from meteorological, administrative, and fire behavior standpoints, the boundary lines of these areas were determined. At this point he should then give a general idea of what this system is and what it will do and write on the blackboard, in short sentences, the main points of the system, as he explains it to the trainees.

Using the attached outline, that is the first page of it, and the same technique as above outlined, he should go on through this outline and tie the entire thing together, attempting to appeal to the trainees as an individual that the Fire Danger Rating System has a personal use to him, using such illustrations as: - he may want to go in for supplies or take

some leave and if his District Ranger knows quite definitely what the conditions are, he is in a better position to grant the request of the Guard or Lookout.

If the instructor feels that he has given them a general picture of what it is about, he should then take them to the field for instructions in making observations and compilations. To instruct in the use of the various instruments, the "Four Step Method" should be used and each trainee required to take down in his notebook his observations, as these figures can be used when he makes up his Form 1009-E.

In Step I of any of the instructions, the instructor should attempt to arouse the trainees' interest by some story or illustration that will appeal to the men in the use of the system. Each trainee should go thru the observation a sufficient number of times to be sure that he understands how to make a complete observation.

The entire instruction in Fire Danger Rating will probably require from four to five hours for a group of not to exceed six trainees.

While the "Four Step Method" is used to train on individual instruments, in principal, the "Four Step Method" can be used to put the entire instruction on, for instance: Step I being the introduction by the instructor; Step II being where the instructor shows the trainees how to use the instruments, etc.; Step III where the trainees make a complete observation and Step IV where they come in and fill out Form 1009-E.

This thought is optional with the instructor but it is thought that each trainee should make a complete observation, put the figures on Form 1009-E and if he is to do compiling, make the compilation and put it on the above form.

When the observer returns to the Guard or Lookout Station, or to the station where he is located, followup inspection training should be

made as soon as possible by a qualified person to be sure that he understands his observations and compilations correctly. Emphasize at the Guard School and in the followup training in the field the need for accuracy of observations and records.

There is one other thought that has proven of value: instructions should be kept on an understandable basis; nevertheless, it is good business to tell the trainees, if they are interested in the more scientific reasons back of the system that the District Ranger will be glad to furnish them additional material which they can read and secure the information they want. The trainees' attention should also be brought to the fact that they are furnished an observer's manual and they should follow that manual religiously, in making an observation, until they are sure that they do it correctly.

GENERAL OUTLINE

(Lesson Plans follow this Outline)

OUTLINE OF SUBJECT

What is Fire Danger Rating?

Use in Suppression

Use in Presuppression - Annual Leave

Use in Prevention

Use to back up requests for funds.

How is Fire Danger Rating secured:

Observations at stations made

Observations telephoned or radioed to compilers

Compilers plot on chart

Secure indexes and class of day.

Class of organization then set up, based on this and guided by Fire Weather forecast.

Fire Weather Forecast

What is it? How used?

Where does it come from?

Types of forecasts - regular and special.

Fire Weather Bureau stations as separate from Fire Danger Rating Stations. Some stations may handle both.

T rainees

Give instructions in making observations.

RELATIVE HUMIDITY & PRECIPITATION

Fan Psychrometer

Use Lesson Plan in the book.

Rain Gauge

I. What does rain do to a fire?

What does rain do to fuel moisture?

II. Consists of:

Stand

Outside recepticle

T ube - holds 1/2 inch Measuring Stick - graduations

How to measure

Lower stick gently. Pull out.

Read and record to .01 inch.

When brass tube has overflowed, pour into it and measure overflow.

Keep leaves, dirt, etc. out of gauge.

Periodically check.

III. Have trainees make a reading.

1/2" FUEL MOISTURE

Fuel Moisture Scale

I. What are they used for?

What value is moisture in fuel?

II. Plumbing of scale. Use of plumb, 100 gr. weight, 400 grams.

Scale reads zero when plumb.

Graduation in % of fuel moisture. 50% saturation.

III. Have trainees plumb up and tell what graduations read.

Fuel Moisture Scale - continued.

I. What are the 1/2" sticks?

How are they made?

II. Sticks 10" above ground.

Faced North.

Marked side always up.

Handling sticks. Clean hands or paper.

Hang on proper hook - 100 grams.

Wait till pointer stops.

Watch for wind. Incorrect readings.

Record on fire weather observer's daily memorandum.

Replace sticks right side up and north end to the north.

III. Have trainees make a reading.

WIND VELOCITY

Anemometer

I. What part does wind play in rate of spread?

In drying out fuels.

II. Must be upright.

Must be oiled at top, instructions later.

T hrow in switch, allow one buzz.

Start timing number of buzzes per minute.

Correct from table if needed.

Record on Observer's Memorandum.

(Dial type will receive special instructions individually from either F.S. or Weather Bureau).

Beaufort Scale. Use of miles per hour.

III. Have trainees take a reading and also estimate by Beaufort scale.

IGNITION & SPREAD INDEXES

Explain what this means.

LIGHTNING INDEX

Explain, prediction based on Fire Weather Forecast and observations in the field to predict kind, intensity of storm and probable number of fires.

VISIBILITY

I. What is visibility?

What does it depend on?

What is maximum distance Lookout responsible for?

Distance a fire can be seen - 15 miles or 1/10 of an acre?

II. Use of targets - Local Forest problem.

Use of haze meters.

Judging distance - North and South only.

Recording readings on Fire Weather Memo.

III. Have trainees estimate distances.

Form No. 1009-E.

I. What are the needs for records?

Research data.

II. Cross out columns not needed in form.

Go thru and explain data from Fire Weather Observer's daily memorandum recorded here.

Fill out all other columns required on this form.

How many copies to be made?

Who to mail to.

When to mail.

Neatness.

Form No. 1009 - E - Continued

III. Have trainees fill out form from data given by instructor.

IV. Give another set data.

USE

Explain what this means.

HERBACEOUS STATE

Explain this - green, curing, cured.

FIRE LOAD

Explain what this means.

CLASS OF ORGANIZATION

Explain what this means

* * * * * * *

Care of Station

Go thru need for protecting sticks.

Do not clear away grass, etc.

Do not paint other than white.

Keep shelter secure.

Always faces north.

Keep it plumb.

Use of weather terminology

What does it mean.

The lesson plans which follow are for the subjects listed below:

1. Thermometers (Max. and Min.)
2. Fan Psychrometer
3. Wind
4. Fuel Moisture
5. Rain Guage
6. A. Cloudiness
   B. Lightning
   C. Visibility
7. Lightning Fire Danger Meter
8. Region 5 Fire Danger Meter
9. 1009-E

They are arranged in what appears from experience to be the best sequence for teaching the various subjects and instruments.

LESSON PLANS

1.	Instruction Topic:	Taking Maximum and Minimum Temperature Observations.
2.	Instruction Units:	A. Minimum Temperature Observations. B. Maximum Temperature Observations.
3.	Limited to:	Instruction Units listed above - A. - B.
4.	Class:	Six Trainees.
5.	Location:	Field.
6.	Material	Weather Shelter - Maximum and Minimum Thermometers - observer's daily memorandum.
7.	Estimated time:	30 Minutes.

LESSON A - Minimum & Maximum Temperature Observation

(Explain that these are to be taken only where instruments are provided.)

STEP I

OVERHEAD QUESTIONS Introduction to Main Topic.

1. How many times a day is the minimum and maximum temperature recorded?
2. Are special instruments required for obtaining minimum and maximum temperature?
3. Do all stations record minimum and maximum temperatures?

STEP II

Operations or Instruction Points	Plan for Instruction
1. Minimum temperature observation.	Explain principle of minimum thermometer Explain when observation to be taken and why it should be taken before maximum temperature observation. Explain position instrument should be in when read and demonstrate how instrument is read.
2. Setting the Minimum Thermometer set after observation has been taken.	Explain why minimum thermometer should be reset after setting maximum thermometer.

Operations or Instruction Points	Plan for Instruction
	Demonstrate how to set minimum thermometer.
3. Recording Observation.	Explain that observation is to be jotted down in observer's daily memorandum and then transferred to Form 1009-E later.
4. Maximum temperature observation.	Explain principle of maximum thermometer.
	Explain when observation is to be taken.
	Explain position instrument should be in when set.
	Explain and demonstrate how to take a reading from the maximum thermometer.
5. Setting the maximum thermometer after observation is made.	Explain and demonstrate how to reset maximum thermometer.
6. Recording observations.	Explain that observation to be jotted down in Observer's Daily Memorandum and then transferred to Form 1009-E later.

STEP III

Have each trainee take complete minimum and maximum temperature observation. Check if each trainee understands how to read and reset instruments. Answer any questions asked and assist any trainee in those points he does not understand.

STEP IV

Have each trainee demonstrate how to make complete observation of both maximum and minimum thermometers in correct sequence without help of instructor.

1.	Instruction Topic:	How to perform the necessary operations related to the use of a Forest Service Fan Psychrometer.
2.	Instruction Units:	A. Setting up and servicing fan psychrometer. B. Reading thermometer figures - using the psychrometer and computing humidity from tables.
3.	Limited to:	Instruction Units listed above - A. & B.
4.	Class:	Six trainees.
5.	Location:	Field, clean water available.
6.	Material:	Seven fan psychrometers complete, relative humidity tables, wicking material, Fire Weather Observer's Daily Memo Pads.
7.	Estimated time:	30 Minutes.

LESSON A - Setting Up & Servicing Fan Psychrometer.

STEP I

Overhead Questions: Introduction to main instruction topic.

1. Have you ever seen a dense fog?
2. What is fog?
3. What does fog do to a fire?
4. Will a fire burn rapidly today?
5. Is there any moisture in the air?
6. How do we know whether there is any moisture in the air?

Explain what we mean by "Relative Humidity" and in what way we use it.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Purpose of wicking.	Explain that the wicking is used to form a film of moisture around the bulb, to produce the necessary evaporation.
2. How to install wicking.	Show which thermometer to use. Demonstrate how to place wicking on thermometer, allowing sufficient length to reach bottom of bottle containing water. Explain importance of keeping wicking clean.

Operations or Instruction Points	Plan for Instructions
	Do not touch wicking with fingers any more than absolutely necessary. Explain that grease and dirt prevent free access of water to wicking and prevents rapid evaporation.
3. How to wet bulb.	Demonstrate how to wet wicking by filling bottle with clear water, then placing bottle under thermometer on which the wicking is installed. Demonstrate the raising of bottle to completely immerse the wet bulb wicking. Explain why this should be done before thermometer readings are taken.
4. Servicing Psychrometer.	Explain how often bottle should be cleaned and water changed - how often wicking should be changed. Point out oil hole on crank shaft and how often it should receive oil.

STEP III

Have trainees install wicking and fill bottle with water and place in position. Check if certain points have been put over and are understood.

STEP IV

Step IV unnecessary.

LESSON B - Reading the thermometer figures, using the psychrometer and computing humidity from tables.

STEP I

Bridge over from Lesson A.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How scale is graduated.	Show and explain the graduations of the thermometer.
2. How mercury rises in column.	Demonstrate by placing hand on bulb.
3. How to turn fan crank on psychrometer.	Demonstrate what speed to turn fan crank.
4. How to read wet and dry thermometers.	Demonstrate how to stand when turning fan crank so that top of mercury column is clearly distinguishable.

Operations or Instruction Points	Plan for Instructions
	Explain that fan crank should be turned until minimum reading of wet bulb is reached. Explain recheck readings need not be made if thermometers are closely observed while turning fan crank.
5. Applying readings to humidity tables.	Explain how pressure table is selected according to elevation of weather station. Explain how to read humidity tables. Demonstrate on memo pads how the two thermometer figures are subtracted - then refer results to correct pressure table to obtain humidity.

STEP III

Have each trainee practice locating figures on the wet and dry thermometers - then turn the fans and take new readings. Let each member compile the two readings on the memo pads and then refer to the correct pressure table for the humidity reading.

Question the group and check to determine if they have grasped all the points of the lesson.

STEP IV

Group repeats and does all the operations unassisted. If desirable go through lesson using soiled tubing and note results.

1. Instruction Topic: How to perform the necessary operations relating to the use of a Standard F.S. three or four cup anemometer.

2. Instruction Units: A. Setting up and servicing anemometer.

   B. Measuring and recording wind velocity from anemometer in operation.

3. Limited to: Instruction Units listed above - A & B.

4. Class: Six trainees.

5. Location: Field: if possible in a location where there is a light wind.

6. Material: Seven anemometers, buzzers, push buttons 25' insulated telephone wire, 14 dry cells, watches or clocks, Fire Weather Observer's Daily Memo Pads.

7. Estimated time: 45 Minutes.

LESSON A - Setting Up and Servicing Anemometer.

STEP I

Overhead Questions: Instruction to main topic.

1. What part does wind play in rate of spread?
2. In drying out fuels?
3. What relation does wind have to high or low humidity in this territory?

Explain briefly how wind conditions fit into the Fire Danger Organization set up.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Setting up anemometer.	Explain mechanical construction of anemometer - how geared - electrical contact system, etc. Demonstrate how to connect wires from batteries, to anemometer, to switch, and to buzzer. Explain type of circuit and how to tell when properly connected.

Operations or Instruction Points	Plan for Instruction
	Explain best type of wire to use.
	Explain necessity of placing instrument nine feet above ground, and in a clear surrounding.
	Explain best type of mounting and support for installation.
2. Servicing Instrument	Point out lubrication locations, and explain necessity for periodic checking
	Explain length of service to be expected from batteries.

STEP III

Have each trainee wire up his instrument and point out lubrication locations - check and answer any questions which the trainee may ask. Check if certain points have been clearly understood.

STEP IV

Step IV unnecessary.

LESSON B - Measuring and Recording Wind Velocity from Anemometer in Operation.

STEP I

Bridge over from Lesson A.

STEP II

Operations or Instruction Points	Plan for Instruction.
1. Measuring wind velocity.	Explain that the direction from which the wind is blowing is noted at the time each observation is made. Explain symbols to be used in noting direction.
	Explain practicability of wind vane for this purpose.
	Demonstrate use of switch and with a watch count number of signals made by buzzer per minute.
	Explain necessity for allowing one buzz before timing and counting starts.
	Explain necessity for counting signals for several minutes to obtain accurate measurement.

Operations or Instruction Points	Plan for Instruction
2. Recording wind velocity.	Demonstrate recording figures on memo pads and calculating. Explain the velocity is number of signals divided by number of minutes. Explain and demonstrate use of correction table for certain types of anemometers. Explain frequency of periods of observations.

STEP III

Have trainees go through measurement procedures - checking all points that are necessary for accurate observations. Let each member compile his readings on the memo pads - Question group to determine whether they have grasped all points of the lesson. Assist and correct when necessary.

STEP IV

Members go through procedure unassisted.

III

1. Instruction Topic: How to perform the necessary operations related to making observations of fuel moisture indicating scales.

2. Instruction Units:
   A. Installing Fuel Moisture Supports and Sticks.
   B. Checking and Reading Fuel Moisture Scales.

3. Limited to: Instruction Units Listed above, A & B.

4. Class: Six trainees.

5. Location: Field.

6. Material: One fuel moisture indicating scale, 100 gram test weight, seven sets 1/2" fuel moisture sticks, and seven sets iron wire supports - #9 galvanized, Fire Weather Observer's Daily Memo Pads.

7. Estimated time: 30 Minutes.

LESSON A - Installing Fuel Moisture Supports and Sticks.

STEP I

Overhead questions - Introduce to main topic.

1. What is fuel moisture?
2. How does fuel moisture affect rate of spread?
3. Of what value is fuel moisture?

STEP II

Operations or Instruction Points	Plan for Instruction
1. Installing supports	Demonstrate how to force supports into soil. Explain how they must be 15" apart and 10" above ground in such a manner that when the sticks are in place they will face north and south. Explain necessity for placing supports in a location where herbaceous growth has not been disturbed and where they will receive exposure to sun for greatest number of daylight hours.
2. Placing sticks on supports.	Demonstrate how to place fuel moisture sticks on supports. Explain how to handle sticks with care -

Operations or Instruction Points	Plan for Instruction
	keeping them free from oil, paint and dirt - handle with paper or gloves.
	Explain when sticks should be replaced.
	Explain why the end with the steel hook must face north and the numbered side of the stick facing up.

STEP III

Have trainees install wire supports and place the sticks - check work and answer any questions which the trainee may ask and make certain the points explained are clearly understood.

STEP IV

Step IV unnecessary.

LESSON B - Checking and Reading Fuel Moisture Scales.

STEP I

Bridge over from Lesson A.

1. How are and from what materials are 1/2" fuel moisture sticks made?

STEP II

Operations or Instruction Points	Plan for Instruction
1. Checking scales for levelness.	Demonstrate hanging test weight on scale arm loop marked 100.
	Explain purpose of check - to plumb scales.
	Explain what position pointer is to assume for correct check.
	Demonstrate how to plumb scales if pointer indicated other than 'zero' reading.
2. Reading scales.	Demonstrate removal of fuel moisture sticks from supports and hanging on the loop marked 100.
	Explain necessity for tapping pointer lightly to make sure it swings freely.
	Explain how to read scale while sticks are in place.

Operations or Instruction Points	Plan for Instruction
	Explain how to write reading on memo pad - Record moisture content to nearest 1/2 percent i.e. 15 percent or less and to nearest whole percent if over 15.
	Demonstrate removal of sticks from scales and return to wire supports.
	Explain that sticks must be in correct position. Repeat care in handling.

STEP III

Have trainees go through procedure of checking and reading scales. Check all points that are necessary for accuracy. Let each member write his readings on a memo pad. Question group to determine whether they understand lesson. Assist and correct when necessary.

STEP IV

If necessary have members go through procedure unassisted.

1.	Instruction Topic:	How to perform the necessary operations related to a Standard Forest Service gauge.
2.	Instruction Units:	A. Setting Up & Servicing Gauge. B. Measuring Precipitation and Reading Stick Figures 1-Rain; 2-Snow.
3.	Limited:	Instruction Units listed above, A & B.
4.	Class:	Six Trainees.
5.	Location:	Field, Water Available.
6.	Material:	Seven train gauges, measuring cylinders, measuring sticks, carpenter levels, Fire Weather Observer's Daily Memo Pads.
7.	Estimated time:	30 Minutes.

LESSON A - Setting Up and Servicing Gauge.

STEP I

Overhead Questions

1. What does rain do to fuel moisture?
2. How much rain do we have each season?
3. Will the last rain prevent a fire from starting today?
4. What periods are set up for checking Rain Gauges?

Explain the necessity for measuring and recording rainfall and the different ways that it applies to Fire Control Activities.

STEP II

Operations or Instruction Points	Plan for Instructions.
1. Setting up gauge.	Demonstrate how to place gauge on stand, install measuring cylinder and catching funnel. Explain need for accuracy in placing measuring cylinder under catching funnel. Show how to examine the rim of catching funnel for bent edges. Explain importance - accurate measurement.

Operations or Instruction Points	Plan for Instructions
	Demonstrate leveling of gauge on the stand.
	Explain importance of this check - stand may have been disturbed - accurate measurement of rainfall.
2. Servicing gauge.	Explain necessity for periodic checks and removal of debris from gauges - accurate measurement.
	Explain importance of keeping stick free from grease, oil and paint.

STEP III

Have trainees install and level gauge - checking that all points are understood and that the lesson has been put over.

STEP IV

Step IV unnecessary.

LESSON B - Measuring Precipitation and Reading Stick Figures 1-Rain; 2-Snow.

STEP I

Bridge over from Lesson A.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to measure precipitation and read stick figures - Rain.	Pour several quarts water in catching funnel. Demonstrate how to insert stick slowly through catching funnel until it rests on bottom of measuring cylinder.
	Explain need for inserting stick slowly.
	Demonstrate and explain how to read stick figures.
	Explain how to record on pad - Numbers or stick read 10-20-30 etc. - record 0.10 0.20, 0.30, etc.
	Explain procedure of removing catching funnel, throwing out water in measuring cylinder and demonstrate how to pour more of the water in main container into measuring cylinder and measure. Repeat until all of the water is measured.

Operations or Instruction Points	Plan for Instructions
	Explain necessity of using clean rag to dry sticks instead of bare hands before taking new readings.
	Explain any quantity less than 0.01 - will be called 'trace'.
	Explain frequency of periods of observations.
2. How to measure contents and read stick figures - Snow.	Explain how and why catching funnel top and inner measuring cylinder is removed and main container left open to catch snow.
	Explain type of snow storm that is feasible to this method.
	Explain how to warm gauge slightly to avoid evaporation - then measure contents.
	Explain procedure of calculating.

STEP III

Have trainees pour water in catching funnels of rain gauges and go through measurement procedures - checking all points that are necessary for accurate measurement. Question group to determine whether they have grasped all points of the lesson. Assist and correct where necessary.

STEP IV

Members go through procedure unassisted.

1. Instruction Topic: How to make observations and record other factors relative to the Fire Danger Rating System.

2. Instruction Units: A. Cloudiness.

B. Lightning.

C. Visibility.

3. Limited to: Instruction Units listed above - A-B-C.

4. Class Six Trainees.

5. Location: Field - if possible on a Lookout.

6. Material: Seven - Fire Weather Observer's Daily Memo Pads - Seven copies: U.S.Weather Bureau Cloud Forms - Small blackboard.

7. Estimated time: 45 Minutes.

LESSON A - Cloudiness

STEP I

Overhead Questions:

1. Do all clouds aid and make for low spread danger?

2. How are clouds classified by U.S.Weather Bureau? Explain purpose of observations.

STEP II

Operations & Instruction Points	Plan for Instructions
1. How to observe and estimate cloud formations.	
a. Time observations will be made.	Explain time of day observations will be made, and who shall make them.
	Explain how cloud amounts are expressed in relation to whole sky.
	Explain the necessary points to make a complete observation i.e. - 1. Type of high clouds, major head and direction moving from. 2. Type of low clouds and same data.

Operations & Instruction Points	Plan for Instructions
	Demonstrate making an observation, using 'Cloud Form' publication to determine type. Emphasize necessity of further study of 'Cloud Form' publication.
2. Recording	Explain using 'Cloud Form' publication - the symbols and figures necessary to make recording.
	Place results of observation on memo pads.
	Explain procedure of recording smoke and fog.

STEP III

Have trainees make observation of another cloud formation using 'Cloud Form' publication to determine type - Check - give aid and ask questions of each individual regarding symbols and numbers to be used and procedure of recording on memo pads.

STEP IV

Unnecessary - unless members of group have erred to a great extent in their work.

LESSON B - Lightning

STEP I

Overhead Questions:

1. What are the indications that point to an approaching thunderstorm?

2. Do different cloud bases indicate whether moisture will accompany lightning storms?

3. How do lightning storms affect Class of Fire Organization?

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to observe and estimate intensity of lightning storms.	Note on blackboard data to be observed and estimates. Have trainee copy in memo pads.
	Explain importance of jotting figures in Fire Weather Memo Pads while making

Operations or Instruction Points	Plan for Instructions
	observations, rather than on 1009-E.
a. Time lightning first sighted.	Explain - When first flash is noted it is recorded to nearest 15 minutes within the hour. Place a supposed time on blackboard and pads.
b. Direction & Distance to storm	Demonstrate estimating direction from station in which thunderstorms lie, and distance in miles to nearest point of storm - with aid of Lookout Map. Jot supposed figures on blackboard and pads. Explain estimation can be made of the distance by timing the lapse of time between flash and clap of thunder. (5 seconds per mile.)
c. Direction of travel	Explain importance of observing frequently the path the storm is taking - why two directions in observations desired.
d. Cloud base level	Explain - To be estimated to nearest 1000 feet above sea level - use topographic features when possible or use fire finder and map - note figures on blackboard and memo pads. Explain when elevations of cloud base will be recorded above ground.
e. Intensity of lightning.	Explain terminology used for recording intensity - how determined - note a supposed intensity, on blackboard and pads.
f. Time lightning last sighted.	Explain when last flash is noted - it is recorded to nearest 15 min. in the hour. Place a supposed time on blackboard and pads. NOTE: Explain - Use of Guides for Estimating Thunderstorm Cond. on pp. 20-22 in Fire Weather Observer - U.S.Forest Service-1939.

STEP III

Have trainees make observations and estimate a supposed storm in another location - using fire finder and map to estimate distance and elevations, etc. - record on memo pads - check the results of

their work - give aid when necessary, and question each individual concerning all points making for accurate results.

STEP IV

Step IV unnecessary unless instructor is of the opinion too many errors made in Step III.

Lesson C - Visibility

STEP I

Overhead Questions:

1. What is visibility?
2. What are the factors that make for poor visibility?
3. How does visibility affect the detection system?

Explain how visibility may lead to losing or controlling a fire - Explain purpose of observation.

STEP II

Operations or Instruction Points	Plan for Instructions
1. How to observe and estimate visibility.	Explain time of day observations are to be made and who shall make them. Explain: Criteria that determines visibility measurement - i.e. the maximum number of miles that a Lookout can see smoke produced by a fire of not more than 1/10 acre. Explain in what directions observations will be made. Demonstrate making an observation to the north, using Lookout's Map to figure distance. Explain recent developments to aid in observations - haze meters, etc.
2. Recording	Explain terminology necessary in making recording. Demonstrate writing down of figures on memo pads.

STEP III

Have trainees make observations to the south - using

Lookout's Map to estimate distances - record on memo pads - check the results of their observation, give aid when necessary and question each individual concerning all points making for accurate results.

STEP IV

Unnecessary - unless members of group have erred to a great extent in their figures and observation.

1. Instruction Topic: How to use the Lightning Fire Danger Meter in computing the Lightning Index.

2. Instruction Unit:
   A. Computing the uncorrected Lightning Index from given mean ground elevation and cloud base elevation.
   B. Determining corrected index from uncorrected index and forecast or observed conditions.
   C. Determining approximate number of fires to be expected from storm.

3. Limited to: Instruction Units listed above - A-B-C

4. Class: Six trainees.

5. Location: Class room.

6. Material: Seven Lightning Fire Danger Meters - a dummy lightning storm forecast - scratch paper - blackboard.

7. Estimated time: 30 Minutes.

LESSON A- Computing Uncorrected Lightning Index

STEP I

Overhead Questions - Introduction to Main Topic.

1. During what months may we expect Lightning Storm conditions?

2. Is there likely to be a decided increase in fuel moisture content during Lightning Storm conditions?

3. What is the character of most of our lightning storms?

STEP II

Operations or Instruction Points	Plan for Instructions
1. Computing uncorrected index from given cloud base elevations and given mean ground elevations	Explain what the Lightning Fire Danger Meter is based on. Explain how the mean ground elevation for a zone is derived. Explain cloud base elevations are taken

Operations or Instruction Points	Plan for Instructions
	from forecasts or local observations. Demonstrate how to compute uncorrected index from figures, shown on blackboard, of given cloud base elevations and mean ground elevations.
2. Recording Lightning Index.	Explain forms to be used and procedure as set up on Forest.

STEP III

Have trainees compute uncorrected index from figures, shown on blackboard, of given cloud base elevations and mean ground elevations. Answer any questions trainees may ask and assist any trainee in those points he does not understand.

STEP IV

Step IV unnecessary unless trainer deems it advisable.

LESSON B - Determining Corrected Index From Uncorrected Index.

STEP I

Bridge over from Lesson A.

STEP II

Operations or Instruction Points	Plan for Instructions
1. Using Correction Table to compute corrected index.	Explain why Correction Table necessary Demonstrate on blackboard, how to compute corrected index from Percentage Correction Table.
2. Recording Lightning Index.	Explain forms to be used and procedure, as set up on Forest.

STEP III

Have trainees compute corrected index from figures shown on blackboard, of given mean ground elevations, given cloud base elevation and dummy lightning storm forecast. Answer any questions trainees may ask and assist any trainee in those points he does not understand.

STEP IV

Step IV unnecessary unless trainer deems it advisable.

LESSON C - Determining Approximate Number of Fires to be Expected from Storm.

STEP I

Bridge over from Lesson A.

Operations or Instruction Points	Plan for Instruction
1. Determining approximate number of fires to be expected from storm.	Explain reason for multiplying corrected index by 0.4
	Explain what a unit area is and demonstrate, by blackboard, how to derive at number of fires by multiplying a given number of unit areas by corrected index by 0.4
2. Recording number of fires.	Explain forms to be used and procedure as set up on Forest.

STEP III

Write down on blackboard, a given mean ground elevation, cloud base elevation and dummy lightning storm forecast and have trainees find approximate number of fires to be expected. Answer any questions trainees may ask and assist any trainee in those points that he does not understand.

STEP IV

Step IV unnecessary unless trainer deems it advisable.

1. Instruction Topic: How to use the Region 5 Fire Danger Meter and record computed data.

2. Instruction Units:
   A. Computing Ignition and Spread Indexes.
   B. Computing Fire Load Index.
   C. Converting Fire Load Index to Class of Organization.

3. Limited to: Instruction Units listed above - A-B-C.

4. Class: Six trainees.

5. Location: Class Room.

6. Material: Seven Fire Danger Meters- scratch paper-blackboard.

7. Estimated time: 45 Minutes.

LESSON A - Computing Ignition and Spread Indexes

Explain fundamentals of Ignition and Spread Indexes.

STEP I

Overhead Questions ° Introduction to main topic.

1. Of the two variables used in determining Ignition and Spread Indexes, which is the most important in determining Ignition Index?

2. In determining Spread Index?

3. Can the number of all man-caused fires be estimated from the Ignition Index?

STEP II

Operations or Instruction Points	Plan for Instruction
1. Computing Ignition and Spread Indexes.	Explain component parts of Fire Danger Meter - i.e., why wind velocity only 26 miles per hour maximum - why Fuel Moisture only 26% maximum - why ignition and spread has maximum of only 10. Demonstrate how to compute figures on Ignition and Spread Indexes from Fuel Moisture and Wind Velocities. Write computed figures of Ignition and Spread Indexes on blackboard.

Operations or Instruction Points	Plan for Instruction
2. Recording Computations.	Explain proper forms to be used and procedure in recording computations. (all forms except 1009-E Optional with Forests)

STEP III

From Fuel Moisture and Wind Velocity figures that trainees have in Observer's Daily Memorandum, have them compute the Ignition and Spread Indexes and note them in Observer's Daily Memorandum.

STEP IV

Step IV unnecessary unless trainor deems it advisable.

LESSON B - Computing Fire Load Index

STEP I

Explain what Fire Load Index is and from what it is derived.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Computing Fire Load Index	Explain and demonstrate by blackboard how Fire Load Index is derived at from given Ignition, Lightning and Spread Indexes. (Explain Lightning Index is used in computations only when Lightning Index exists.)
2. Recording Computation	Explain proper forms to be used and procedure as set up on Forest.

STEP III

Have trainees find, from Fuel Moisture and wind velocity figures that they have in Observer's Daily Memorandum the Fire Load Index and note it in Observer's Daily Memorandum. Answer any question trainees may ask and assist any trainee in those points he does not understand.

STEP IV

Step IV unnecessary unless trainor deems it advisable.

LESSON C -Converting Fire Load Index to Class of Organization.

STEP I

Explain different classes of organization.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Converting Fire Load Index to Class of Organization.	Explain principle of conversion table. Explain when Class of Organization can be modified and who by. Demonstrate use of Conversion Table in converting Fire Load Index to Class of Organization.
2. Recording Class of Organization.	Explain forms to be used and procedure as set up on Forest.

STEP III

Have trainees find Class of Organization from Fuel Moisture and Wind Velocity figures they have in Observer's Daily Memorandum and note in Observer's Daily Memorandum.

STEP IV

Step IV unnecessary unless trainer deems it advisable.

VIII

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1. Instruction Topic: How to prepare U.S. Weather Bureau Form 1009-E - Station Record - using the figures obtained from observations.

2. Instruction Units:
   A. Preparing form for use.
   B. Recording the data obtained from field observations: taken from trainees' Fire Weather Observer's Daily Memorandum Pad.

3. Limited to: Instruction Units listed above - A & B.

4. Class: Six trainees.

5. Location: Classroom

6. Material: Seven Pads U.S. Weather Bureau 1009-E with carbon paper and oil boards - blackboard.

7. Estimated time: One hour.

LESSON A - Preparing Form for Use.

STEP I

Overhead Questions

1. In what manner is the 1009-E advantageous for the fire weather reports used by the Forest Service and Weather Bureau?

2. What benefits are derived from using only one form?

3. In what ways is it advantageous to use Fire Weather Observer's Memo Pads in making observations?

NOTE: Lesson A will not be necessary when 1009-E is revised or a substitute form to take its place has been prepared.

STEP II

Operations or Instruction Points	Plan for Instruction
1. Preparing heading	Explain number of sheets to be prepared.
	Explain necessity for filling in every item completely - where to obtain data for each item that is not known.
	Why is this important?

Operations or Instruction Points	Plan for Instruction
2. Changing items under "Humidity" heading.	Demonstrate on blackboard scratching out the two items - "Vapor Pressure" and "Dew Pt." - insert "Max. Rel. Hum." and "Min. Rel. Humidity".
3. Changing items under "Wind" heading.	Demonstrate on blackboard scratching out the two items - "24 Hr. Movement" and "Average Hourly Velocity" - insert - "Dial Reading" - "Max. Vel. & Time".
4. Changing items under "Lightning".	Demonstrate on blackboard scratching out "% Lightning confined to clouds" - insert - "Cloud elevations". Demonstrate on blackboard scratching out "Number of fires resulting" - insert - "Intensity".
5. Changing items under "Misc." and "Remarks".	Explain and write on blackboard under "Misc." and "Remarks" - " 1/2" Fuel Moist.; Visibility No., Visibility So. - Herbaceous Stage, Ignition Index and Spread Index".

STEP III

Have trainees make changes on their copies of 1009-E. Check their work and give aid where necessary - answering any questions trainees may ask.

STEP IV

Step IV unnecessary.

LESSON B - Recording the data obtained from field observations; taken from the trainees' Fire Weather Observer's Daily Memorandum Pads.

STEP I

Bridge over from Lesson A.

STEP II

Operations or Instruction Points.	Plan for Instruction
	Explain use of Fire Weather Observation pamphlet - U.S. Forest Service 1939, as an aid in preparing 1009-E. Explain importance of inserting all dates-when starting new sheet.

Operations or Instruction Points	Plan for Instruction
1. Time of observations.	Explain what three periods of the day are set up for making observations. Explain importance of all observations being started not more than 20 minutes before designated time but must be completed by designated time. Explain that the designated time of observation should be shown even though observation is taken prior to the time. If after designated time, actual time of observation should be shown. Explain that special observation may be required at other hours by the District Rangers.
2. Temperature	Demonstrate on blackboard the recording of maximum and minimum temperatures at hours specified. Explain that this recording will be made only at stations equipped with those instruments. Demonstrate on blackboard recording of wet and dry bulb. (Use figures from memo pads that were taken in field observation.)
3. Humidity	Demonstrate on blackboard recording of humidity. (Using figures from memo pads that were taken in field observation.) Explain maximum and minimum Rel. Hum. is recorded only at those stations equipped with hygrograph or hygrothermograph.
4. Wind	Demonstrate on blackboard recording of direction and velocity. (Use figures from memo pads that were taken in field observation.) Explain - Dial reading column used only by those stations equipped with U.S. Weather Bureau dial reading anemometers. Explain "Max. Velocity and Time of Observation" column is used optionally - use Beaufort Scale at stations without anemometers.

Operations or Instruction Points	Plan for Instruction
5. Clouds	Demonstrate on blackboard recording amount, kind and direction data for clouds. (Use figures from memo pads that were taken in field observation.)
6. Weather	Explain that state of weather is to be recorded after each cloud observation, using symbols on Page 14 of Fire Weather Observation - 1939, considering amounts and kind under "Clouds". Explain that character of day column will be recorded at the last observation - based on state weather - Page 14 of Fire Weather Observation - 1939 for symbols.
7. Precipitation	Explain symbols used to record character of precipitation - symbols page 4- Fire Weather Observations - 1939. Explain when there are storms the importance of noting time precipitation begins and time ended. Explain intermittant periods of 15 min. or less are not deducted. See page 4 - Fire Weather Observations for symbols. Demonstrate on blackboard the recording of precipitation. (Use figures from memo pads that were taken in field observation.)
8. Lightning	Demonstrate on blackboard the recording of data on lightning. (Use figures from memo pads that were taken in field observation.)
9. One-half Inch Fuel Moisture Sticks.	Demonstrate on blackboard the recording of data on 1/2" Fuel Moisture Sticks. (Use figures from memo pads that were taken in field observation.)
10. Visibility	Demonstrate on blackboard the recording of data on "Visibility". (Use figures from memo pads that were taken in field observation.)
11. Herbaceous Stage	Explain the different herbaceous stages and how recorded.

Operations or Instruction Points	Plan for Instruction
12. Ignition & Spread Index.	Demonstrate on blackboard the recording of complete indexes. (Use figures from memo pads that were taken in field observation.)
13. Completing & Mailing Sheets.	Demonstrate on blackboard completion of page by filling in completely the information requested on bottom of sheet. Explain distribution of completed sheets-who mailed to and number mailed.